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apc+

September 2009

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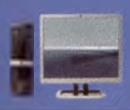

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06 editorial

TONY SARNO

QUEENSLAND POLICE WILL PATROL THE STREETS, LOOKING FOR UNSECURED RESIDENTIAL WI-FI

I am going to be a dissenting voice among the commentators who have greeted the news that the Queensland police will patrol the streets looking for unsecured residential Wi-Fi with some bemusement. They have been unnerved by the idea of cops wardriving down one's street and slapping residents with "unsecured network" notices rather than spending more time catching traditional crooks. I don't think that wardriving police is a crazy notion. In fact, it's a great, progressive idea. I speak from personal experience, since I regularly spend time in Brisbane where I am constantly surprised at how many unsecured Wi-Fi networks my notebook picks up. These are home networks in which the owner has left the router in its unsecured default configuration and not set the password or enabled encryption. I recently remarked to a friend that if I lost my wireless modem I'd easily get by in Brissie just by driving down the street. I couldn't do that as easily in Sydney or Melbourne, which are Wi-Fi fortresses. Clearly the Queensland police have worked out the same thing.

The real problem with unsecured Wi-Fi networks is not that your neighbour can use your connection, but that wardriving criminals can log in via your router and get up to all kinds of things. How likely is it? Very. In fact, it happened to me a couple of years ago, when someone driving in a suburban street in Townsville logged in via an unsecured connection and made bombing threats to various airlines, under my name and email address, which he'd just pulled at random out of *APC*! Once the police established my innocence, the trail ran cold because they could only trace the net connection from which the threats were issued to an unsecured router (its owners unaware of what their unsecured connection had been used for). The truth is, from a tech perspective, there would have been no way of tracing the offender if it wasn't for the police luring him out by other subterfuges. Criminals are using unsecured routers for financial fraud and identity theft. All credit to the Queensland police, who have identified this as a major problem and are willing to do something about it.

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Bytesize
Mini news

TRY ANDROID ON YOUR PC
Curious about Google's new mobile phone OS? Now you can download a LiveCD and run it on any x86-based PC. You just need to download the LiveAndroid CD and you can boot right into it (or run it under virtualisation via a package like Sun VirtualBox or Microsoft Virtual PC).
http://tinyurl.com/liveandroid

DECODE BLUESCREEN ERROR MESSAGES
The Windows bluescreen may be ubiquitous, but the cryptic error codes it throws up are in no way designed to be easy to understand. Until now, that is! "WhoCrashed" will read the error logs and translate them for you. One example: it converts the error code 0xFFFFFA60024B1DB0 into "NVIDIA compatible Windows 2000 Miniport Driver", showing it's the graphics driver causing your bluescreen.
http://tinyurl.com/meg8gt

TELL YOUR BROWSER WHERE TO GO
Ever feel like shouting at your browser, "Just f@#$ing quit, would you!?" Now with Mozilla's new "Ubiquity" plug-in for Firefox you can do just that. It may not understand your commands in "French", but you can, for example, type "Weather in Sydney" and get results in slick-looking browser panels rather than hunting for a weather site.
http://tinyurl.com/66cw38

"Windows Lite" to beat Chrome OS?

Google has admitted it's making its own OS, but Microsoft might not be far behind.

Google's new OS, dubbed Chrome OS, will be a Linux distribution — just as its mobile phone OS, Android, is, and it's pitched at low-power devices like netbooks. Not surprisingly, Google says it will be focused around internet apps like Gmail, Google Docs, Google Earth/Maps and so on. That's about all Google has disclosed so far, along with an ETA of end of 2010 for netbooks to start shipping with the OS installed.

However, Microsoft's Bill Gates has poured scorn on the new OS, pointing out that it is "Just another Linux distro. There are many, many forms of Linux OSs out there and packaged in different ways and booted in different ways." Microsoft has been working on a related project called Gazelle, which is part highly compartmentalised browser (where each tab, and even element of a web page, operate in its own sandboxed process) and part 'web OS' — a browser designed to house many applications at once.

One thing's for sure, though — "full flab" operating systems like Windows 7 are not the future for ever-smaller and lighter devices that have always-on internet connectivity. The problem is that battery technology develops much slower than PC hardware, and the power required to run big OSs is a barrier to making truly pocketable PCs.

HOT PRODUCT

Archos 5in tablet

The iPhone is a great all-round device, but for serious web browsing, this new Archos device could be better.

Web browsing on the iPhone is undeniably better than anything ever seen on mobile phones before it, but there's a lot of zooming in and out involved, due to the iPhone's limited screen size.

The new Archos 5in tablet (right), aims to ship overseas from 15th September, runs Google's Android mobile OS and is rumoured to include an ARM Cortex A8 processor — the fastest mobile processor available. Naturally, it will pack 3G/HSPA for mobile broadband and Wi-Fi for use at home, work or at a hotspot. It is also expected to have a screen resolution rivalling low-end PC screens.

This new class of 'internet tablet' sits between netbook and mobile phone — they're designed to fit neatly into the front pocket of your backpack or a handbag, for use at a moment's notice.

Efforts in creating web tablets have, to date, been slow to catch on, with manufacturers struggling to find the right balance between price, size and capability. Nokia's N800 internet tablet, for example, inexplicably lacks mobile broadband capability and runs a custom Linux distro that lacks the interface fit, finish and responsiveness of Google Android.

TOP 10
BEST TECH PRANKS

1. **NOTHING HAPPENS WHEN THEY CLICK...** because you took a screenshot and made it their desktop background.
2. **THEY CAN'T SPEL FOR SHINT...** because you added Autocorrect entries to subtly change what they wirte to differemt words.
3. **THEIR COMPUTER HAS SEXY GROANS...** because you changed their Windows USB connect sound to a porn clip.
4. **BLUESCREENS GALORE...** because you installed the Bluescreen screensaver.
5. **MOUSE SEEMS SLUGGISH...** because there's sticky tape over the optical sensor.
6. **HP PRINTER ASKS FOR MARS BARS...** because the LCD display was changed using the HP Printer Job Language (HPPJL) command set.
7. **THEY'RE ALWAYS ON RUSSIANBRIDES.COM...** because their hosts file is remapped to point the intranet URL there.
8. **SPAMMER!...** because you edited their email signature to add a line stating they distribute extension products.
9. **TAINTED PRINT-OUTS...** because you pre-printed office paper with an extremely light, offensive message.
10. **FIREFOX GOES CRAZY ON APRIL 1...** because you installed the "total confusion pack"

WIN!

Nominate your favourite tech pranks for the chance to win two movie tickets

apcmag.com/top10.htm

IS iPHONE LEGAL?

"I was fined $250 and 4 demerit points because my iPhone was on the dash and I was using it as satellite navigation!"

Those were the shocking words of a Sydney Morning Herald reader writing about his recent traffic fine, raising the spectre that some police might actually be drawing the fraught distinction between a TomTom or Navman with a 3.5in display and an iPhone with a 3.5in display.

Considering some higher-end navigators have GPRS transceivers built in to receive live traffic information or access live points of interest, it's equally arguable that a dedicated navigator is a mobile phone nowadays.

The law around using mobile phones in cars varies from state to state, but, for example, in Victoria, it is prohibited to use a 'handheld' mobile in the car, full stop. The point is clearly arguable — for example, if a phone was mounted on the windscreen and you never touched it, it would be easy to argue that it was not 'handheld'. However, all phone navigation systems require data entry via the touch screen or phone keypad, and voice controlled systems are only just starting to emerge.

3D CAMERAS GO MAINSTREAM

Fujifilm's 3D camera aims to give photography more depth.

If you're old enough, you might remember the View Master where you could see 3D images on image discs inserted in the top. Now, Fujifilm is taking it into the digital era, with a camera that has two lenses and two image sensors, capturing true 3D images. Dubbed Fujifilm Finepix Real 3D, it offers 10 megapixels of 3D goodness. The camera even has a 2.8in LCD that can display 3D image previews. Fujifilm has also worked out how to display the pictures with digital photo frames. The frame shows images at 60 fps and rapidly flips between the two images, fooling the eye into seeing a 3D scene. There are some downsides: the camera won't spit out standard JPEG images, and, well, nobody has 3D monitors or printers at home yet.

TRIBAL COUNCIL...

APCMAG.COM ASKED

Are there viable legal alternatives to pirating movies/TV/games yet?

YOU REPLIED

4% 86% 10%

APCMAG.COM ASKED

Do you think mobile internet tablets will ever take off?

YOU REPLIED

63% 24% 13%

HEAD2HEAD

The next generation of OSs are on our doorsteps or just around the corner. Which has the best bang for buck?

	GOOGLE CHROME OS	MAC OS X SNOW LEOPARD	WINDOWS HOME 7 PREMIUM
Underlying OS	Linux	BSD	NT 6.1
The sales pitch	A lightweight OS that can run with long battery life on low-power CPUs, offering an ideal environment for using web-apps.	Faster and smaller than OS X Leopard; helps apps spread across multi CPU cores.	Way faster than Vista; improved GUI including new taskbar; home networking is much simpler.
Single coolest feature	Ultimate integration with Google services. (Which don't suck like Windows Live.)	OpenCL allows apps to put general processing tasks onto the graphics card GPU.	GPU-accelerated video transcoding, and DirectX 11 "is poised to be at the vanguard of the GPGPU revolution."
Verdict	It's free, it'll be fast and lightweight, but it remains to be seen whether Google can make web apps like Google Docs full-time stand ins for local office apps.	This release is all about speed, reliability and cutting down bloat. Three cheers for that approach.	Windows 7 is great, but it's what Vista should have been all along. There's no "killer feature" and Microsoft should probably give it free to Vista owners.

MICRO-USB CHARGERS GO UNIVERSAL

The tyranny of different connectors for every mobile phone is about to end, with 17 firms signing up to a standard connector — including Apple.

Apparently, replacing all mobile phone chargers with a single standard using micro-USB will remove 51,000 tonnes of waste. How chucking out all the existing ones and replacing them with new ones will reduce waste isn't immediately clear, but the mobile industry does have a point when it says that the ability to use anyone's mobile charger with your phone will cut down on duplicate chargers all over the place and wasted standby power as many chargers are left plugged in indiscriminately.

Surprisingly, even Apple, which uses its thoroughly proprietary 30-pin iPod connector for the iPhone, has agreed to provide micro-USB charging by 2012. Given the large ecosystem of iPhone and iPod compatible accessories on the market, it's almost certain that Apple won't dump the 30-pin connector but will simply add a micro-USB port to its phones as an additional charging option or provide a 30-pin-to-micro-USB converter in the box with each phone.

The new micro-USB charging standard, officially — but not so creatively — dubbed "Universal Charging Solution (UCS)" will also offer much higher energy efficiency, sucking up to three times less power than a bog-standard charger to deliver the same charging efficiency to the phone.

NUMBER CRUNCHING

250,000,000
NUMBER OF FACEBOOK USERS AS AT JULY 2009.

14,000,000,000
The proposed cost for the US government to provide an Amazon Kindle ebook reader to all of America's 56 million school children.

6,831
THE NUMBER OF LITHIUM-ION NOTEBOOK BATTERY CELLS USED IN A TESLA ROADSTER ELECTRIC CAR TO MAKE UP THE CAR'S BATTERY UNIT.

THE (A)PC REVOLUTION
SEP / 1986

MICROSOFT WORD 3

The launch of a new version of an old favourite always brings with it a mix of excitement and regret. Needless to say, with the release of Word 3, my wish-list has lengthened rather than shortened. However, real improvements have been made; there's no doubt that what has sprung from the loins of Word 2 is a better product.

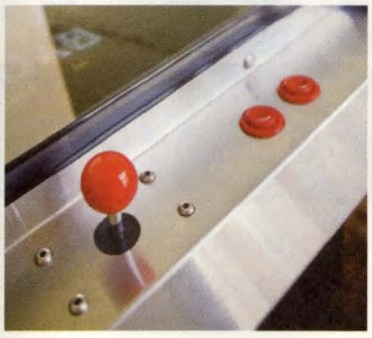
SMALLEST PC COMPATIBLE

It had to happen. Discware has announced the introduction of the first hand-held IBM compatible computer, called the Data-computer. The 1.1kg machine runs MS-DOS on a 80C88 running at 4MHz. Memory is 128Kb standard, expandable to 256Kb. Three AA size batteries provide up to 70 hours of operation.

AMSTRAD LEAK

Mitsubishi has carefully leaked the imminent arrival of the next generation Amstrad computer. Mitsubishi AWA, the Australian distributor for Amstrad, is pretending to be tight lipped about it, presumably in an attempt not to be left with full warehouses of old Amstrads.

WONDER YEARS
Got a hankering for old time arcades? Relive your glory days of owning the hi-score on the local machine.



NEW PRODUCT

Arcade games for the home

You can buy a real-life, hard-wired arcade game table for your lounge room.

Enthusiasts who hanker after the simple gameplay and synthesized bleeps and bloops of old arcade games have been building emulator systems for years, the most popular of which is Multi Arcade Machine Emulator (MAME).

However, emulators inevitably have trade-offs — compatibility glitches, things that aren't emulated quite as in the original, and the difficulty of adapting gameplay designed for sticky joysticks and heavy-duty fire buttons to the delicate touch of a PC keyboard and wireless mouse.

Now, Queensland Company Arcade Tables Pty Ltd is manufacturing "the real thing" — the actual games running off silicon, rather than emulation. They use the JAMMA platform — a system designed in 1985 for actual arcade game cabinets. Arcade Tables had been manufacturing its tables using CRT TVs for authentic fuzzy arcade game feel, but recently has introduced a new LCD option that makes the games appear to be playing right on the glass of the arcade table.

Putting one of these babies in your lounge room is definitely not cheap, at about $3,000. But when you consider how much you poured into arcade machines in your misspent youth (or, if you're younger, how much you escaped pouring in), they're value.

Mustknow
Essential Knowledge

WIRELESS USB GOES LOW-TECH

Intel may have a whiz-bang specification for wireless USB, but industry adoption is moving slowly due to the fact that its use of the ultrawideband radio frequency means it requires separate government approval in every country.

Not to mention the fact that communication regulators use different radio frequencies for different things, making a "one size fits all" wireless USB standard practically impossible.

However, a lower-tech approach may be the saviour of the wireless USB concept. Japanese company KDDI has come up with a wireless USB 2.0 standard that uses infra-red for its communication, allowing speeds of up to 1Gb/s. Of course, infra-red for data communication is nothing new — until the last decade, most notebooks had a low speed infra-red port for syncing with PDAs and mobile phones. That slowly disappeared as Bluetooth caught on, but wireless USB may well see its re-emergence.

Topsite
URL of the month

GOOGLE SQUARED

Thinking of buying something expensive? Chances are you're putting together a comparison table to figure out which is the best product. Now Google can do it for you through its new 'Google Squared' search engine. It's Google's answer to Wolfram Alpha — but rather than trying to build an encyclopedic page for you, it builds comparison tables instead. It often doesn't pick the right columns, but you can add and remove columns with a few clicks.

www.google.com/squared

ON THE DVD

VISTA WITH THE BUGS FIXED

Is Windows 7 just an upgrade to Windows Vista, or is it an OS in its own right? **James Bannan** finds out.

With the imminent public release of Windows 7, it's interesting to contrast the marked difference in public perception of a product which isn't yet available on the shelves with its predecessor. Since the first public beta build was released early this year, feedback on Windows 7 has been overwhelmingly positive, but in spite of this there is an unshakeable core of critics who dismiss Windows 7 as simply "Windows Vista with the bugs fixed". Is this assessment fair? Is Windows 7 really just a Vista upgrade or does it stand independently?

It's almost understandable why this perception of Microsoft's latest OS offering is so prevalent. In spite of its advances over Windows XP, Vista's unpopularity is legendary and Microsoft is obviously very keen to move on. But Redmond has also learned some harsh lessons, and the internal processes and team structures which underpin Windows 7's development have been changed dramatically.

But first some facts. "Windows Vista with the bugs fixed" is otherwise known as Windows Vista SP1, not Windows 7. Vista represented a huge amount of re-engineering and change away from Windows XP — a new major kernel version and new driver, security and network models. But, everything didn't go smoothly and these new features, which during Vista's development cycle were driven primarily by customer requests and feedback, ended up becoming the visible face of some very bad early publicity from which Vista has never recovered.

"Although we fixed most of the compatibility problems which were present at RTM with Service Pack 1," said Jeff Alexander, IT Pro Evangelist for Microsoft Australia, "it still left a nasty perception in peoples' minds, which was fuelled by bloggers and media to such an extent that the perception never went away. As for comments that Windows 7 is just Vista Version 2, it's clear to see that Windows 7 hasn't been engineered anything like Windows Vista, even though it's built on Vista's foundations."

CHANGES IN THE DEVELOPMENT

In fact, the biggest change surrounding Windows 7 has been Microsoft's internal approach to the product. The development, testing and management structures which gave us Windows Vista were actually designed to produce Windows XP, so given Vista's lengthy development cycle of approximately five years, the underlying workflows were starting to look a little long in the tooth by this stage and were possibly not the best structures to produce a problem-free Vista, given the complexity and sweeping changes present in the product.

In an October 2008 article on the Engineering Windows 7 Blog, Larry Osterman, a veteran Microsoft employee and developer, spoke about his experiences working with Windows 7 as compared to Windows Vista. The traditional model of Windows source code development has been the tree/branch approach, where features were sandboxed away from the main build code (otherwise known as "winmain"), developed independently and then merged back into winmain. At this stage the testers checked for bugs, the developers fixed the bugs and product managers oversaw the process for each feature. The problem with this process was that because bug fixes always carry an inherent risk of introducing another problem, as the winmain build neared completion it became harder for the development teams to merge bugfixes due to increased risk aversion.

Given the exacerbating complexity of the product, these problems emerged as delayed shipping dates, dropped features and a general lack of communication from Microsoft. Looking back, given the nature of the marketing campaigns at the time (Remember "The Wow is Now"?) it seems that Microsoft was hoping that the product would speak for itself. Ironically and unfortunately for Microsoft, it did.

In contrast, Windows 7 development has been driven by small teams consisting of

developers, testers and a program manager — all working together on individual aspects of the Windows 7 product. Under the guidance of Steven Sinofsky, senior management at Microsoft were placed at arms' length from the decision-making process, giving the teams the ability to take full responsibility for the feature. In fact, before any feature could be merged back into the main product code it had to be feature-complete and ready to ship. Each milestone build had to be treated like the finished product with no cross-milestone development or future work spanning builds — something which did happen during Vista's development. Additionally, any feature with dependencies on another feature required the relevant teams to sign an SLA (Service Level Agreement) that they were aware of the inter-dependencies.

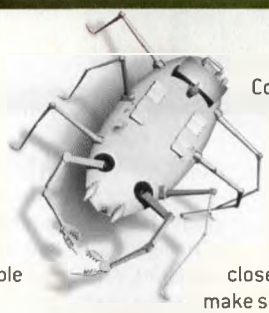
HAS IT WORKED?

What has been the impact of Microsoft's reorganising and soul-searching? Is it all just touchy-feely fuel for the marketing department or has it produced some solid results?

Based on consumer feedback and the popularity of both the public beta and RC builds, the evidence looks strong that Microsoft are pushing all the right buttons with Windows 7. The quality, performance and stability of the pre-RTM builds have been extremely impressive, enabling users to give the operating system a thorough workout in production before the final release hits the shelves.

"The last time I remember being able to run daily builds as an everyday operating system because the quality was so good was with Windows 95," said Alexander, "and with Windows 7 we're spending lots of time making sure we reach all the quality milestones so as to avoid the same perception problems which we had with Windows Vista, as well as the genuine compatibility problems which were present at RTM."

"We over-promised and under-delivered with Windows Vista — features were simply pushed out regardless of whether they were ready. With Windows 7 we did almost the exact opposite. If features weren't up to the required quality standards they were pulled, rather than have a feature which wasn't ready hold up the overall product. And this is reflected in the fact that the public beta was good enough to run as a live operating system. When I ran up the Windows Vista beta there were loads of problems with hardware devices and there was no way you could use it as your everyday operating system.



Compare that to Windows 7 — I have every machine in my house running the RC build, and I can do this because the product teams have hit all the quality milestones."

Microsoft has also worked closely with hardware vendors to make sure Vista's nightmare of driver compatibility doesn't happen again. The fact that so many drivers are available via Windows Update before the product is released, and the fact that most Windows 7 machines need only one online update to be fully functional is a testament to the success of this approach.

Feedback coming in from businesses and IT Pros has been equally positive. Because of the build stability of both Windows 7 and Server 2008 R2 (the products will RTM at the same time), Microsoft has been able to pro-actively release deployment guidance, documentation, demonstrations and labs well ahead of RTM, something which didn't happen with Vista.

So while Windows 7 is certainly built on Vista's foundation and doesn't represent a quantum shift away from its predecessor, the thought and day-to-day practicalities which have gone into its development mark it out as something different and a true next-generation operating system. Goodbye Vista. APC

14 epinions
HAVE YOUR SAY

epinions@acpmagazines.com.au

Come on, have your say! We want to hear what you think. Add to these discussions or email your views (in fewer than 250 words) to epinions@acpmagazines.com.au. All correspondence becomes the property of *APC* and is subject to editing. Letters must include writer's full name, street address, suburb, state and phone number to be considered for print publication and to be in the running for Letter of the Month prizes. Address and phone details will not be published.

THIS ISSUE'S WINNER

Letter of the month

Darrin wins a TP-Link Wireless N Router and Adapter bundle worth over $200.

PLEASE UNBUNDLE

Imagine going into a fast food chain restaurant and saying "Can I have a hamburger with cheese?" and being told "Sorry, we don't do burgers on their own, you need to take the fries and the drink and that will be $7.95."

This is exactly what happens when you buy a computer. Bundling computer systems gives the perception that the software component comes free with the computer when in reality it is provided under an OEM (Original Equipment Manufacturer) agreement.

In the agreement the supplier gets a significant discount on Microsoft software under certain conditions. One of those conditions is that they offer Microsoft software on the 'majority' of their computers.

Isn't it time for the ACCC (Australian Competition and Consumer Commission) to regulate computer retailers so that they include the individual prices in their bundles and allow for us the consumer, to reject any component of that bundle we don't need or want, including the software?

After all, it isn't acceptable with a burger, why should it be acceptable with a computer?

Darrin Ritter
Adelaide, SA

This month we've got happy Linux users and Microsoft is actually offering good customer support. Has the world gone mad?

RUN LINUX IN WINDOWS

I was looking round the web for ways of running Linux inside Windows and run both without rebooting. After about half an hour I stumbled on this Gem: "andLinux" (**www.andlinux.org**). It's a Linux kernel that has been ported to Windows, and by using either an XFCE Panel or a tray icon you can install Linux packages and run them straight through Windows. The project is in Beta 1 and I have installed it and ran it with no issues. I suggest it is worth looking at.

Sam Fredericks
Tauranga, NZ

HAPPY LINUX NEWBIE

In response to "Linux Frustrations" (*APC* February), I empathise with people frustrated with learning Linux, but felt it important to state that I am a Linux newbie who is very happy with the switch. I also use Windows and think it is a great OS. Believe me, I've had, and still do have, frustrating moments, but the more I learn, the easier it gets and Linux distros get easier to use each year. I would recommend trying Linux from a Live CD, setting up a dual-boot system or installing on another hard drive/flash disk. All of these options will not "nuke" an existing setup. VMWare Server is another option for virtual Linux and Windows installs.

Brad Herdson
Camden, NSW

SHOWOFF COWBOY

In *APC* July, the 'security professional' who wrote "Pro network security scans" boasts about how he sniffed a root password and then proceeded to log into a server, download the password file and run it against a password cracker. His actions clearly indicate that he is not a true professional but a showoff cowboy! In the numerous security audits that I have done, it is clearly over once root has been obtained. The downloading of the password file is clearly unethical, unless explicitly permitted in the terms of engagement. Looks like people have forgotten Intel vs. Randal L. Schwartz (**http://en.wikipedia.org/wiki/Randal_L._Schwartz**).

Brian Meilak
Bruce, ACT

TEACH THE TEACHERS

In September, every year 9 student in NSW is going to receive their very own Lenovo S10e netbook. Teachers are getting them too, which is scary. Half the teachers at my school are either against the movement or don't know how to use computers. For example, my art teacher makes us use word processors to edit photos (and I've spoken to some seniors doing art, and using the Liquify tool is as far as they have gotten in Photoshop Elements. They have no idea what they're missing out on!). Also,

MEDIA CENTRE WHAT?

I'm looking for a replacement gadget for my LG PVR. After a lot of research I decided on the Sony VAIO TP3 living room PC. Despite its $2,000 price tag, it's a nice small box with a Blu-ray player. However, for a final test, I was interested in how it handled the IceTV EPG.

First stop, Domayne at Belrose, Sydney. Response was: "Sorry, we disconnected our demo system due to lack of interest, but you can see our YouTube demo. . ."

Second stop, City Sony Central. Staff told me on the phone that they had it up and running and would demonstrate it to me. I arrived and to my surprise, there was no IceTV, only Windows Media Center.

Last stop, Chatswood Sony Central. IceTV was installed, but I couldn't see it in action as there was no internet connection.

Meantime I lodged several inquiries through Sony Customer Care and received more meaningless answers indicating that the 'consultant' did not have a clue about TP3 and IceTV. Brilliant! Four-nil. The VAIO TP3 seems to be a nice product, but the support level from Sony is nil.

Wiesiek Szydlowski
West Pymble, NSW

DOES IT WORK?
Apparently the VAIO TP3 living room PC works well, just don't expect a demo, the stores don't seem to use it.

there's apparently going to be a filter on the internet connection, but I wonder how long that's going to last. I reckon students will find their way around it really quickly. Personally I can't wait to get these netbooks. As soon as I get mine I'm going to dual-boot Ubuntu!

Brad Bennett
Mt Warrigal, NSW

VMWARE BONANZA

I was surprised to see that Ashton Mills (*APC* April) claimed VMWare doesn't have a free product other than VMWare Player. I have been using VMWare's free VMWare Server product for at least a year. This is not to be confused with Server ESX or similar. The server software runs on Linux or Windows 2000 Server or Windows 2003 Server. It's found at **www.vmware.com/download/server/**. There are several versions, but they all create virtual machines from scratch and allow you to install any supported OS. They supply rpm or tar.gz for Linux. I have VMWare Server hosting my virtual internet connection PC, plus several other VMs, and use it for testing or playing with new Linux distros and preserving a few old machines before the hardware died.

In all I have about 20 VMs lying around on disk, and about four running at any one time.

David Noakes
Brisbane, Qld

GOOD SERVICE

I realise it's customary to bag Microsoft for its poor service and 'don't care' attitude, but I got a pleasant surprise when I tried to upgrade from IE8 Beta 2 to the release version. As soon as I upgraded it stopped working and affected other programs, so after trying many different things I thought I'd ask Microsoft for help. I didn't expect anything more than a standard email telling me to go the FAQs. Instead I got an email within 24 hours with a detailed list of things to try and email them back with my findings (they even chased me for not replying). In the end I found it was a section in the registry that was locked down. But it is good to know it's actually possible to get help from Microsoft.

Dave Chinnery
Pegs Creek, WA

CORRECTION

In a recent review of the Brother MFC-6490CW printer you said that a user needs to initiate operations from the computer for anything other than email or FTP. This is wrong. I own this machine, I did a 34-page OCR, which I sent from the printer to my computer. It took around three minutes to complete, and all on Wi-Fi. I think something went wrong in the setup of the software on your machine.

Stephen Peirce
Sydney, NSW

apc

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15 enduser

FROM THE READERS OF APC

apcenduser@acpmagazines.com.au

Do you work in the IT industry and are forced to deal with inept and clueless end users on a daily basis? If you have an interesting or amusing story, email us at apcenduser@acpmagazines.com.au. All correspondence becomes the property of *APC* and is subject to editing. Letters must include writer's full name, street address, suburb, state and phone number to be considered for print publication and to be in the running for prizes. Address and phone details will not be published.

V FOR STUPID

APC reader John Lang was recently interviewing a developer for a job when he asked the applicant whether he had his own blog. "He said he didn't need one because he used Facebook, adding that he spent 'every spare minute on it,'" says Lang. "Something told me I should have a look at his Facebook profile just in case he really did waste a lot of time on it. This was an important role within our business and I needed to make sure we had the right person." Lang's glad he checked. The applicant had made most of his profile private, but not the photos: "Some of the shots taken by his friends showed him paralytic at various parties, which was disappointing, but what people do in their spare time is not for me to judge. But in another set of photos taken at an office function he was clowning about, doing that stupid tongue-in-the-V sign behind several female colleagues. It wasn't a good look." Lang says he had no intention of hiring a potential sexual harasser, so he went on to the next candidate.

The stupid Facebook end user above and the recent blunder by the wife of Britain's new MI6 chief, Sir John Sawyers, who put candid family shots on Facebook and blew his cover, has inspired us to find other social networking screwups.

HATE MY JOB

A casual employee working for a Queensland Government department was fired earlier this year for saying on her Facebook status that she would refuse to work for "shitty Government departments" in the future. Meanwhile, in the US, an intern at 20th Century Fox wrote highly critical comments about her job and colleagues on a blog under "anonymous" but left enough clues for people to work out who she was. She was sacked soon after.

HOT WATER

Australian swimming authorities clamped down on swimmers' Facebook postings after swimmer Stephanie Rice sent local media into a frenzy after uploading photos of herself on her Facebook page partying hard with fellow swimmers, wearing a fetish police uniform and doing heaps of V-tongue signs. Unfortunately, the clampdown didn't prevent others from posting pictures. Another nightclubber took photos of Rice dancing wildly in a Thailand nightclub after the Olympics and tumbling onto the dance floor. The photos immediately appeared on blogs around the world.

TRASHING THE PLACE

A couple in Folkestone, Kent, published photos of wild parties held in the new flat they'd just rented. The photos showed drunk partygoers dancing on tables and destroying the flat. Visible in the photos was ripped wallpaper, smashed TVs and even damaged chandeliers from which guests had swung. The only problem was that the landlord just happened to check out the tenants' Facebook page. She was horrified and promptly evicted them.

TOO SICK TO WORK

Kevin Colvin, an employee at Anglo Irish Bank in the US's North American arm, told his manager that he'd missed work due to a "family emergency". Davis then posted a photo of himself dressed as a fairy at a Halloween party he'd gone to instead. Incredibly he copied the photo to everyone in the office, so it was no big surprise when his manager found out.

MY GUILT

Heather Ann Tucci of White Burr Lake, Minnesota, was charged with two counts of criminal vehicular homicide when a car she was driving was involved in an accident that resulted in the deaths of two teenage passangers. She pleaded not guilty in court but, then, on her MySpace profile, wrote "Yes, it's my fault because I was the driver, but think about how many of you did what I did. . ." and on she went on a rant in which she admitted guilt but hoped that people would understand. The admission did not escape the authorities.

WINNERS GET THIS

MAGIX Movie Edit Pro 15 is a top-selling video editing program and the perfect solution for beginners to ambitious users. Featuring effortless video capture, straightforward editing, spectacular 3D effects, a large selection of titles and fades, brilliant dubbing, 32 tracks, and the result burned to an interactive CD/DVD or exported to the internet or a mobile player. With MAGIX Movie Edit Pro 15 you can transform your best video recordings into exciting theatre-quality films, including background music, animated transitions, text and special effects – in just three steps! For more information go to **www.qvsoftware.com.au**. Valued at $109.95.

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Late deliveries

Late delivery of products ordered online is a common source of frustration for APC readers. Here's what you can do about it.

The biggest single type of complaint the Watchdog column receives is late delivery of product. One example was Paul Marshall, of Paddington, Queensland, who ordered a notebook from Dell on 14th June.

"This looked to be plenty of time as deliveries were quoted as between 7 and 10 working days," Marshall says. "I was checking online regularly to see how progress was going and became concerned when nine working days had passed and the order had not progressed. I called Dell's customer service and was told that my order was lost in the system and would be progressed." Cutting a long painful story short, Marshall got his Dell notebook on Tuesday the 21st of July.

"Remember that the order date was the 14th June, with delivery quoted on the Dell web site of between 7 and 10 working days," Marshall says. "Well, it actually took 27 working days! There has been no explanation from Dell other than they 'lost' the original order."

At least Marshall got his notebook and a "Sorry we were late" gift of a mouse. Most readers aren't that lucky. Vinnie Nguyen ordered a Nokia N81 from Blue Fly Mobile, and when it didn't arrive after several emails and voice messages, he pretended to be another customer. He contacted Blue Fly Mobile as "Ricky Martin" through a different email account asking about a likely purchase. "They replied to me promptly!" Nguyen said. When he had their attention he mentioned his outstanding order under his real identity and was told the order had been processed.

These are just two of dozens of *APC* readers not getting their ordered products on time. Watchdog contacted the consumer affairs bodies in Victoria and NSW to find out why vendors are allowed to get away with any number of delays and excuses when it comes to delivering the goods ordered.

The simple answer is that since the time of delivery will vary greatly depending on the goods ordered and where they are coming from, there is nothing in the Fair Trading Act that specifically addresses what is a reasonable time for delivery of goods. That's up to the seller and buyer to figure out, but most don't enter into any kind of agreement on this. Sellers will sometimes refer to a delivery period in the Terms and Conditions of the sale, but often they won't. In other words, as a consumer, you have to rely on the seller to meet its obligations and, if not, the final recourse is a trip to the state's consumer tribunal (or Queensland's Magistrates Court).

As a result, Consumer Affairs Victoria suggests that if you intend purchasing online (particularly an expensive item) and the seller's web site has nothing about delivery periods, you should contact the seller via email first and ask what the delivery period is for the item.

Getting that will help you build a case against the vendor if the item is late arriving. However, Consumer Affairs Victoria stresses that just because an item is late still does not mean the contract is breached and you can just cancel the order. If the seller does not want to accept your cancellation and give you a refund arguing extenuating circumstances for the delay, you must then prove that the product has not arrived within a "reasonable amount of time." To establish this you should then write to the seller and give them a chance to deliver the item within a time extension of your choosing, say, within an extra 14 days, warning that if the product does not arrive by then, you will cancel the order and seek a refund. If your case then goes to a tribunal, it will appear that you gave the vendor every chance to deliver the product, including the "reasonable amount of time," and you'll be in a much better position to get justice.

Do you have a consumer complaint? Write to us at: ***watchdog@acpmagazines.com.au***

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20 thelab

PRODUCT REVIEWS & COMPARISONS

LABS ROUND-UP

DIGITAL RADIOS

43

10 years later. . . it's finally here: digital radio has arrived, but what's the big deal, and should you upgrade?

NICK RACE – TECHNICAL EDITOR

NICK'S PICK

KODAK ZX1

In a world of YouTube and web video, a small portable camcorder is almost a must have. The Zx1 fits the bill extremely well. You can slip it in your pocket (it's about the size and shape of a standard point-and-shoot digital still camera) and have the ability to record decent-quality HD footage wherever you are, which is amazing.

PERFORMANCE ✪✪✪✪

The Zx1 records surprisingly high-quality HD footage considering its size. The mic can pick up some extra noise, but this isn't pro gear.

PRICE ✪✪✪

At $299, you can't argue with that at all. Replace your standard point-and-shoot camera with this, and it's still probably cheaper than a mid-market digicam.

SETUP ✪✪✪✪

It's not the most intuitive device ever designed, and poor labelling might have you scratching your head at first. But, once familiar, there's no problem.

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If your smartphone is more for business than pleasure, check this unit out.

8/10

HTC Touch Pro2

It's impressive, but one of the heaviest phones we've seen.

HTC
www.htc.com/au
$1,499

✔ Large high-res screen; well-designed keyboard; beautiful and intuitive user interface.

✖ Thick and heavy; mediocre camera; minimal built-in storage.

SPECIAL FEATURES
Large QWERTY keyboard
Free upgrade to Windows Mobile 6.5
Conference call functionality

The original Touch Pro was one of the best Windows Mobile phones we ever used, mainly because of its sharp, high-resolution display, tactile QWERTY keyboard and flashy TouchFLO 3D user interface. The Touch Pro2 improves on all of those things at the expense of size. It's got a similar footprint to the iPhone 3GS, but it's considerably thicker and heavier, tipping the scales at a portly 178g.

If you can forgive its plus-sized figure, the Touch Pro2 is bound to win you over with its beauty and brains. This is a good-looking device with a polished mirrored front, chrome trim, glossy silver back and tapered edges.

As it's longer than the original, HTC has fitted a larger 3.6-inch 480 x 800-pixel display and a larger QWERTY keyboard. Unfortunately, it's still a resistive display, but it's very responsive and only requires a light tap to register.

The Touch Pro2's keyboard has raised buttons, a spacious layout and sensible arrangement of keys. There's a dedicated row for numbers, light indicators for caps lock and function lock, and shortcuts for messaging, the web browser and wireless settings.

The TouchFLO 3D interface will be familiar to HTC veterans; for the uninitiated, it consists of multiple homescreens that you can move through by sliding your finger across tabs at the bottom. Unlike previous devices, you can hide tabs that you don't use, and HTC has gotten rid of the Start menu — tapping on the Windows flag opens the HTC program launcher.

It runs Windows Mobile 6.1 Pro (with a free upgrade to Windows Mobile 6.5), but the beautifully-designed graphical enhancements that HTC has added on top mean you rarely ever see it — a good thing, in our opinion. It's not just eye candy though. HTC has added a lot of functional improvements that go far beyond the base Windows Mobile features.

As with the Touch Diamond2, the People view groups all of the text messages, email, and phone calls with each person, so you can easily see all of your communications in context without having to open multiple programs. The Touch Pro2 adds the ability to see Facebook status and events for each person, as well as the option to assign their Facebook profile photo to their contact and download their birthday. Oddly, the Facebook application itself doesn't come as standard — you need to download it from the Microsoft web site.

If your job has you making a lot of conference calls, the Touch Pro2's sophisticated conference call functions alone will make it a smartphone worth buying. You can initiate conference calls directly from an email or by tapping the dedicated Conference button on the dialler, and you can also move between the main call and private conversations with particular callers easily.

The speakerphone function is another area that HTC has invested a lot of smarts. Flipping the Touch Pro2 face down automatically activates the speakerphone on the back, which is clear and powerful. It uses noise-cancelling technology to block out ambient noises, but while it works very effectively (music playing in the background was almost completely tuned out), it also degrades voice quality — callers reported that we sounded very scratchy and distant.

The downside to having the speaker on the back is that ringtones and music are muffled — not that you'd use it for music, given the 512MB of built-in memory and proprietary headphone jack. There's a 5MP auto-focus camera, but shutter speed is slow and there's no flash.

Jenneth Orantia

7/10 Sony Ericsson W995

A music phone with an ambitious pricetag.

Sony Ericsson
www.sonyericsson.com.au
$1,109

✔ Compact size; fantastic music player functionality; 8GB memory card.

✖ Overpriced; small low-res screen; occasional lag.

SPECIAL FEATURES
- Tactile keypad
- 8.1-megapixel camera
- Simple icon-based menu

Once you cross that thousand-dollar threshold, you can typically expect a phone to have a large high-res touchscreen, sophisticated OS and access to downloadable app. The W995 offers none of these, but then — not everyone wants them. Sony Ericsson's latest Walkman mobile sticks to doing a couple of things extremely well: standard phone functions and music playback. Plus it's got those all-important tactile buttons and keypad that many still insist on over a touchscreen, and a compact footprint that slips easily into a pocket.

The W995 offers a better music experience than most portable media players, with a 3.5mm headphone jack (the first Walkman phone to have one), playback controls on the face and side, and a dedicated Walkman button for launching the Media application. Built-in memory is scant at 118MB, but it comes with an 8GB memory card.

Video playback isn't quite as good. XviD movies we transcoded using the bundled Media Go desktop program (PC only) looked a little jerky and pixelated, and even with better converter software, the 2.6in screen and 240 x 320 resolution means it's good for watching short clips only. In that sense, the kickstand on the back is probably overkill.

Save for the 8.1MP camera, which is above average as far as stills and video goes, the W995 has a feature set typical for a mid-range feature phone. It's got 802.11b/g Wi-Fi, A-GPS and 7.2Mbit/s HSDPA, but the software is basic. There's noticeable lag in some apps and the accelerometer occasionally fails to kick in and change the display to landscape.

The W995 is a solid media-centric mobile, but given you can get a 32GB iPhone for slightly less, its pricetag seems disproportionate. Thanks Sony Ericsson, but we'll wait for the Satio and Aino phones that you've got coming in Q4.

Jenneth Orantia

8/10 Sony Walkman NWZ-W202

Sony pulls an Apple: lack of screen presented as a 'feature'.

Sony
www.sony.com.au
$119

✔ Cool ZAPPIN feature; compact design; decent sound quality.

✖ Pricey; rarely gets the chorus right.

SPECIAL FEATURES
- Drag and drop file loading
- Flexible headband
- Emphasis base

APC MAGAZINE HIGHLY RECOMMENDED

Apple introduced a new way of navigating through music sans screen on its latest iPod shuffle by using text-to-speech software. Sony is going for a different approach on its Walkman W series, with its funky 'ZAPPIN' technology.

Rather than tell you what the song is while it's playing, the NWZ-W202 treats you to a quick snippet of the track. When you activate the function (by pressing and holding the jogwheel), it traverses your music library and plays four or 15 seconds (depending on whether you're 'ZAPPIN long' or 'ZAPPIN short') of each track's chorus. Once you find the track you want to listen to, you simply press the jogwheel again and the song starts from the beginning.

In practice, it works well, although it rarely got the chorus right. Sony has made the liability of not having a screen into something fun by using lots of cool, if not slightly cheesy, sound effects. Turning the function on results in a futuristic-sounding 'ZAPPIN in' announcement, and likewise turning it off gets you a 'ZAPPIN out'. There's also a video game-style sound effect in between each song snippet.

The NWZ-202's hardware design is no less interesting. Available in pink, white, black, yellow or purple and with a 2GB storage capacity, it consists of a flexible headband that wraps around the back of your head and two hard earpieces that look exactly like Bluetooth headsets. We took it for a jog and found it very comfortable to wear for extended periods.

We were able to get 9.5 hours of battery life. It comes with a USB cradle for charging, and it mounts as a hard drive for simple drag and drop of music files.

Jenneth Orantia

Look ma, no screen — but it does come with bundled sound effects...

8/10

Apple iPhone 3GS

Improves upon the original iPhone 3G in almost every way.

Apple
www.apple.com/au
$1,040 (32GB)

Faster performance; better battery life; larger maximum capacity.

Looks exactly the same as the 3G; low-spec camera; non-replaceable battery.

SPECIAL FEATURES
Longer battery life
Improved camera functionality

Another year, another shiny new iPhone from Apple. The 3GS isn't the revolutionary upgrade that its predecessor was, so existing 3G users may not find anything compelling enough to upgrade — especially if it means breaking a two-year carrier contract halfway through. Those that gave the iPhone a miss the first time round, however, will find it even harder to resist this new model.

Most of the features you'd assume a phone of this calibre would have are finally included. These improvements come from an equal mix of software and hardware changes. On the software side, the iPhone OS 3.0 update (also available to 3G users) adds things like copy and paste, MMS, internet tethering, search and push notifications. Hardware changes in the 3GS take it the rest of the way by improving the camera, battery life and performance, and adding features that are standard on other smartphones like video recording and voice control.

Faster load times and snappier performance are the first things existing iPhone users will notice about the 3GS. We put an iPhone 3G flashed to OS 3.0 and an iPhone 3GS head-to-head and found the latter was faster at everything by a reasonably wide margin. Apple's claim of it being up to 2x faster proved uncannily accurate in our tests: it booted over twice as fast at 22 seconds, loaded the apcmag.com web site in half the time at 26 seconds (both using the same Wi-Fi network) and was all-round snappier when returning to the home screen and running applications.

The faster speed also relates to the iPhone 3GS's bump up to HSDPA 7.2Mbit/s. Real-world speed will vary depending on the network, distance to the nearest mobile tower and other variables, but comparing a 3G and 3Gs on the Optus network, the latter loaded the apcmag.com web site half a minute faster at one minutes and 31 seconds over HSDPA.

Contrary to popular belief that the 3GS would have a matte finish on the back, its hardware design is almost completely identical to the 3G. The only outward change that you don't notice until you start using it is the oleophobic coating on the display, which makes it more resistant to dirt and grease on the screen.

Regardless of the faster processor and identical dimensions to the 3G, Apple has managed to improve battery life on the 3GS — light to medium use should see it comfortably last the day.

We're hesitant to pat Apple on the back for bumping the camera sensor up to three megapixels and adding auto-focus and video recording (long overdue), suffice to say the quality of digital stills has improved, video recording is at a smooth 30 frames per second, and you can trim clips and upload them to YouTube.

Jenneth Orantia

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Don't want to bend to the iPhone peer pressure? Here's another option.

7/10

Nokia N97

Some impressive features, but not the hero we expected.

Nokia
www.nokia.com.au
$1,129

✔ 32GB of storage; large replaceable battery; live widgets on homescreen.

✖ Kludgy user interface; limited software and services; poorly laid out keyboard.

SPECIAL FEATURES
Slide-out QWERTY keyboard
1,500mAh replaceable battery
microSD expansion slot

We reviewed the N97 briefly in our last issue, but after more hands-on time with it, we're back with a full report.

Released almost simultaneously with the iPhone 3GS, it's hard not to compare the two. Both are considered the flagship mobile devices from each vendor, both have 3.5in touchscreens and 32GB of storage and both are roughly the same price outright.

Certainly, power users will be tossing up between them. The N97 has a fair few advantages in its favour. It's got a slide-out QWERTY keyboard, for starters, which will suit those that aren't keen on touchscreen typing. It's also got a beefy 1,500mAh replaceable battery and a microSD expansion slot for adding to the already-sizeable 32GB of storage.

Add to that an app store from which you can buy software, games, themes and ringtones (called Ovi Store), and you've got all the ingredients of a sure-fire iPhone killer. But, as any seasoned cook would know, good ingredients alone don't guarantee a tasty meal. The N97 is definitely an improvement over the 5800 XpressMusic — Nokia's first touchscreen phone — but it's a fair way off from catching the iPhone.

Its main problem is the dated Series 60 5th Edition operating system — essentially, the same OS used on older N and E series smartphones but retro-fitted to work with touchscreens. This UI was designed for buttons and d-pads and hasn't really been optimised for touch, so an action as simple as scrolling down the screen — usually easier on a touchscreen — is confusing, as some screens scroll down when you flick your finger *up* the screen, and others require you to manipulate a scrollbar *down* the screen. Item selection is also inconsistent: some have to be double-tapped and others just once.

Live widgets on the homescreen are one attempt at modernising the UI, and as a feature in its own right, it's handy. You can personalise it with up to five widgets to display on the homescreen, including Facebook, AccuWeather, photo speed dials, music player and news tickers. But scratch past the widgets and it's still the same UI that looked good on the first batch of N-Series phones but now looks flat and uninspired on the N97.

Thankfully, the built-in QWERTY keyboard means you don't have to struggle with the finicky software keyboards. Extending the keyboard pushes the screen up at a fixed angle and automatically flicks the display orientation to landscape. Tactile feedback is good, but the layout could be better. Our main qualms are the small spacebar on the right hand side and the lack of dedicated keys for punctuation symbols. We'd happily give up the five-way navigation pad — which we never used — for more keys and a larger, centred spacebar.

Considering the N97 is Nokia's flagship phone, we were surprised by its relative lack of apps and services compared to its cheaper stablemates. It doesn't come with the Nokia Messaging push email service, nor does it have a Comes with Music subscription service. The N-Gage gaming platform is a no-show, and even the Documents To Go application for working with Microsoft Office files is read-only — you'll need to purchase an upgrade license if you want to create Office files from scratch.

From a multimedia angle, the large 3.5in 640 x 360 display, roomy 32GB of storage, FM transmitter and standard-sized headphone jack makes it a solid media player. The box includes an inline remote control that you can plug your headphones into, but quality of the external stereo speakers is lacking.

Jenneth Orantia

Microsoft

Everyone's watching their money.

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Excel® 2007 helps put you in control of your money. Right down to the small change.

The big expenses, the little splurges – Excel makes it easy to track them all. Set your goals with simple budget templates then manage your bills, payments, and investments to make sure you achieve them. It's all part of Microsoft® Office 2007.

Buy it for your PC. Office2007.com.au

Microsoft® Office Home and Student 2007

Real life tools.

9/10

BenQ JoyBook Lite U121 Eco

All the glitz and glamour

BenQ
www.benq.com.au
$899

Excellent battery life; good netbook performance; design.

Always choose the SSD.

SPECIAL FEATURES
16:9 UltraVivid screen
Large keyboard
Eco-friendly

APC MAGAZINE apc EDITOR'S CHOICE

BenQ is a latecomer to the netbook market, but it isn't coming from behind with this product. The JoyBook Lite U121 Eco adds a swathe of features to the usual netbook template. At its core the U121 sports the usual Atom Z530 processor, paired with the US15W Express chipset with inbuilt GMA500 graphics: par for the course for cutting-edge netbooks. There's 1GB of RAM but the unit supports 2GB, so there's a little wiggle room for upgrades.

Storage was the biggest letdown, with a Seagate Momentus 160GB 5400RPM in our demo unit, while the model supports up to a 32GB SSD as an option. There's 802.11b/g/n, Ethernet and a VGA output.

Here's where it gets good. This 11.6in netbook has a pretty darn good screen. LED backlit, 16:9 widescreen (running at 1,366 x 768) and with a bright coating; "UltraVivid" in BenQ's parlance.

Secondly, the JoyBook Lite U121 Eco has a whopping battery life. Our standard test saw it comfortably waltz in at just under 4.5 hours. With a lighter workload, there's no doubt in my mind it could push six hours. This is backed by a quick charge feature, with a purported 80% capacity in 60 minutes. We didn't see this kind of result (it was a hair under 70% from an empty charge) but that's still nothing to sneeze at.

Last, but not least, the keyboard is a delight. It's big, roomy, lacking any serious lapses in design and doesn't sound like a woodpecker when you type. The trackpad is a little small for those used to a full size notebook, but at least it isn't round (we're looking at you Panasonic).

The unit is claimed to be quite "green", hence the Eco moniker. Though we cannot confirm or deny the claims, BenQ has earned Energy Star and EPEAT labelling for the model.

Superficially, the JoyBook Lite U121 looks good, in a metallic blue or white finish. As a whole, it's simple, does the job it was designed to do and it can do it all day.

Nick Race

6/10

Creative Gigaworks T3

Loud, but not good.

Creative Labs
au.creative.com
$399.95

Tiny satellites; stylish.

Overpriced; mediocre sound performance; no digital inputs.

SPECIAL FEATURES
Compact & stylish satellites
Remote volume & inputs
Energy Star rated

At nearly $400 for a pair of computer speakers, which are described by Creative as having audiophile-quality drivers, we expected something special. Appearance-wise they are cute, standing 15cm tall on their little stands: great for cluttered desktops and places where you want sound rather than speakers. The subwoofer is a 6kg box that is best put on the floor, but again it is not too bulky. All of the connectors are at the back of the subwoofer. Volume is controlled by a dome-shaped pod that plugs into the back of the subwoofer and also provides an auxiliary 3.5mm stereo input and headphone socket. It is definitely stylish! Unfortunately, inputs are analogue only.

For the size of speakers, the Gigaworks T3 system can put out a lot of sound, and if they were priced more reasonably we would have been satisfied. However, at this price point, we expected outstanding sound and we were disappointed.

The subwoofer would be best described as a woofer, because it was unable to properly reproduce room-shaking low-frequency effects from games or classical organ music. According to our tests, the bass bombed out at around 35Hz, which is not particularly good. The satellites did a fair job of reproducing mid-range tones but were lacking in clarity and crispness in the high-frequency range, again our tests indicating that they were struggling to cope with sounds above 15KHz.

As long as we listened to simple music, the sound was acceptable (but nothing special), but auditioning something more complex quickly showed up deficiencies. If you want cute little computer speakers and you don't mind spending a lot of money, these are better than average, but don't buy them for high-quality music reproduction.

David Neiger

7/10

HP Compaq CQ61-1077TU

A middle-of-the-road offering.

HP
www.hp.com.au
From $999

HP's software and support make it great for novices; keyboard doesn't feel cheap; screen is a decent size.

Underwhelming components; lacklustre battery life; nothing to set it apart from the budget crowd.

SPECIAL FEATURES
2GB RAM
15.6in display
Intel Celeron 900 processor

A modest range of components places this notebook square in the middle of budget territory. A 2.2GHz Celeron 900 CPU offers adequate processing for day-to-day duties but isn't the most battery-efficient processor on the block. It's no wonder that the six-cell battery only lasted a mere 130 minutes during our DVD playback test.

2GB of DDR2 memory is included, running at 800MHz, which is plenty of memory to run the included Vista Home Basic comfortably on the 160GB 5,400RPM hard drive. As expected, there's not a discrete GPU in sight, with the Intel 4500MHD at the core of the graphics system.

As a result of these merely adequate components, it was little surprise to see a performance score of 1,946 in PCMark Vantage.

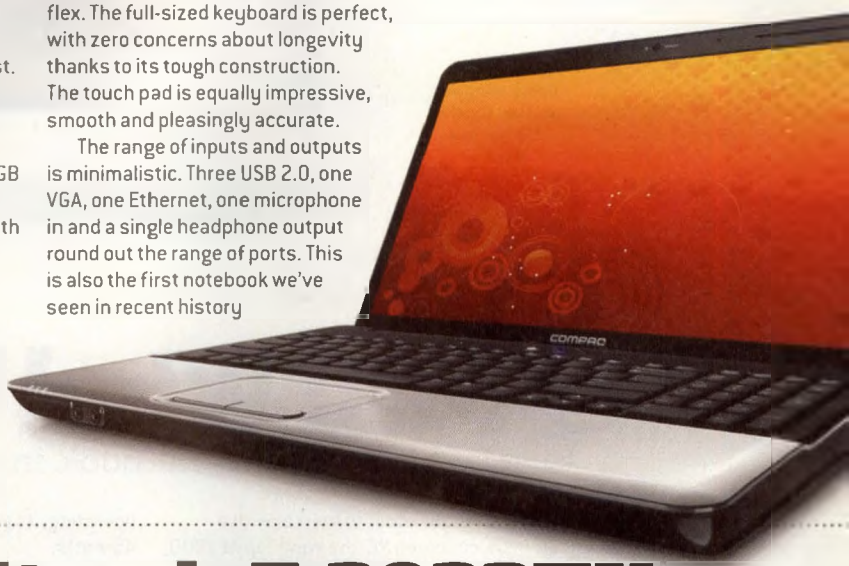
Thankfully, the screen isn't quite so underwhelming. At 15.6in and 1,366 x 768, it's perfectly acceptable for watching videos, and large enough to comfortably view two windows at the same time. Viewing angles are quite limited, so it's not the best device for group presentations.

The all-plastic chassis feels sturdy, with acceptable amounts of screen flex. The full-sized keyboard is perfect, with zero concerns about longevity thanks to its tough construction. The touch pad is equally impressive, smooth and pleasingly accurate.

The range of inputs and outputs is minimalistic. Three USB 2.0, one VGA, one Ethernet, one microphone in and a single headphone output round out the range of ports. This is also the first notebook we've seen in recent history that doesn't have a webcam.

And if you're looking for an ultra-portable device, look elsewhere. At 2.75kg, and 38 x 25cm, this notebook is going to be desk-bound.

Bennett Ring



6/10

HP Pavilion dv7-2022TX

Plenty of heft to this machine.

HP
www.hp.com.au
$2,499

Gorgeous 17.3in screen; plentiful RAM paired up with a zippy CPU; very slick software package.

An outdated GPU leaves it gasping when gaming; very heavy.

SPECIAL FEATURES
17in display
640GB of hard disk storage
Core 2 Duo P8700 processor

The HP Pavilion dv7-2002TX's physical dimensions are as significant as its 3.5kg weight. At 40cm x 29cm, you'll need to clear a sizable area on your desk. There's a reason it's so mammoth — it has a 17.3in screen, with specifications ranging towards desktop territory.

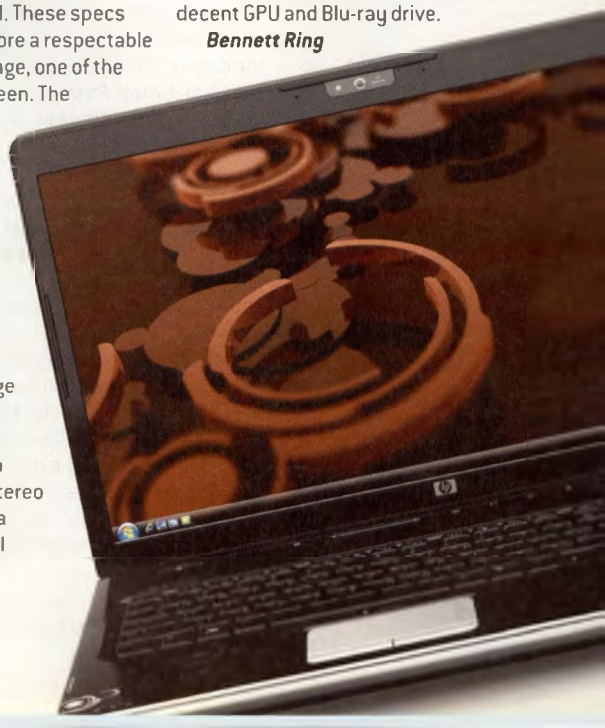
The screen's 16:9 ratio is perfect for movie viewing and has an extremely wide viewing angle. At default settings, the image was a little washed out, but tweaking the contrast and brightness resulted in a much more pleasing image. DVD playback is fantastic, with very little compression artefacts or visible pixels. This is most likely due to the ATI HD4530 graphics chipset. It provides ample power for decoding DVDs but sadly lacks gaming grunt. Regardless of the 512MB of dedicated VRAM it uses, the heart of the HD4530 is a slouch by today's standards.

It's a shame really, as the rest of the hardware is top notch. 4GB of DDR2-800 memory is paired with an Intel Core2 Duo P8700 2.53GHz processor. A spacious 640GB of storage space is spread across two drives, spinning at a moderate 5,400RPM. These specs helped the 2022TX score a respectable 3,567 in PCMark Vantage, one of the better results we've seen. The built in Wi-Fi supports a/b/g/n. The optical drive is lacking Blu-ray support, making do with DVD+-RW.

The full-sized keyboard has little to no flex, and the keys feel responsive and reliable. The shell is decked out with a range of external goodies, including four USB 2.0 ports, an eSATA combo port, HDMI, VGA, two stereo headphone jacks and a webcam. The eight-cell battery gave up the ghost after 157 minutes in our DVD playback test.

While the 2022TX has great potential, we wish HP had included a decent GPU and Blu-ray drive.

Bennett Ring



Seems like every vendor's getting touchy-feely these days...

7/10

MSI Wind Top AE1900

Desktop outside, netbook inside.

MSI
www.msicomputer.com.au
$1,099

Looks good; good value; touchscreen. ✔

Low powered; can be noisy. ✖

SPECIAL FEATURES
Low power consumption
802.11 b/g/n Wi-Fi
Still ships with XP

MSI is the latest to market with a touchscreen PC, the Wind Top AE1900. The 'Wind' brand name suggests it's a low-powered desktop that uses components similar to MSI's netbook range. Fortunately, at $1,099, it keeps the netbook-like, low price tag too.

It's based around a 19in (16:9) widescreen LCD with a 1,366 x 768 resolution. The white monitor bezel is elegantly framed by a Perspex layer that also acts as a stand. A 'foot' at the back can be moved to adjust the degree of tilt, and a webcam is built into the top. Power, volume and brightness buttons are all hidden on the right hand side.

Unlike most netbooks, an optical drive is included — a notebook-style DVD writer pops out on the left. Next to this is an SD/MMC card reader plus two USB ports. At the back are two more USB ports, two audio jacks and a gigabit LAN port. 802.11n Wi-Fi is built in too. When booting up, the fan explodes into life and loudly spins to maximum RPM for a short while, which is annoying. While idling it's very quiet but under load the fan can kick in again. The screen is bright and crisp and the built-in speakers get quite loud (but have virtually no bass). When operating, its power usage is only 45 watts.

Being something of a netbook, its specification is low: there's Windows XP, a 1.6GHz Atom 230 processor (which is dual-core), 1GB of RAM and a 160GB hard disk. XP ticked along well, but simply loading applications can cause things to strain. It's not powerful enough to play back HD video (even from YouTube). It is powerful enough to make the touchscreen software responsive, though. MSI includes a proprietary application called Wind Touch, which sits on top of XP and allows you to operate and access all features by prodding the screen. A stylus is included, but there's nowhere to stow it (so expect it to get lost).

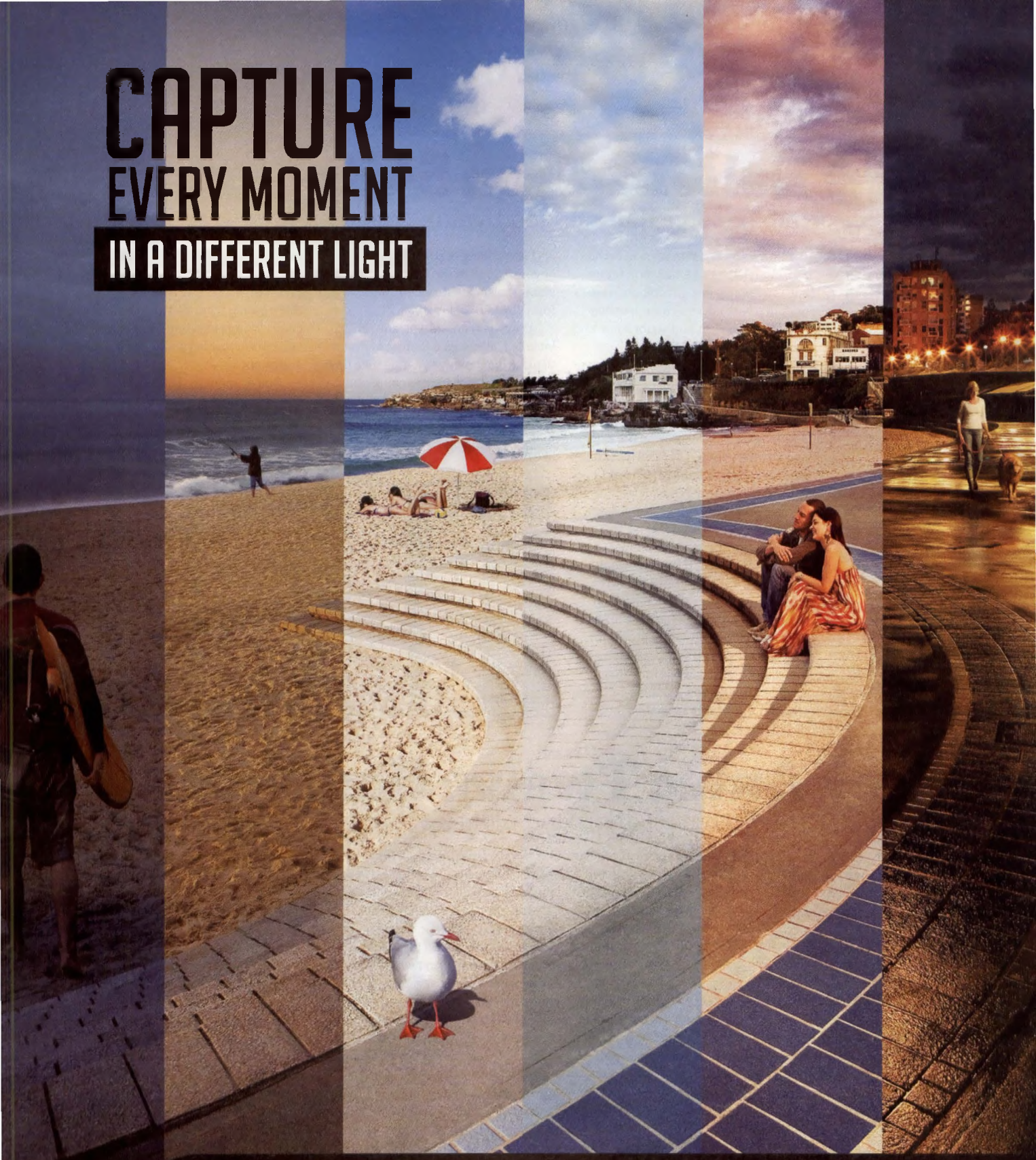
Applications are separated into Work, Fun, Tools and Web. There looks to be a good selection in each tab too: Office 2007 is listed under 'Work' but it's only a trial version. Other useful applications like Cyberlink's Power Director and The Gimp are available for video and graphics editing. The Web tab provides links to IE, Messenger and Skype, while 'Tools' are just XP's built-in tools with a few calibration apps.

The Fun tab includes XP's built-in games but there are also two proprietary ones, creatively titled 'MSI Chicken Game' and 'MSI Star Game'. Both are linked with the webcam and let you steer left or right by moving your head side to side. With the former, you must navigate a chicken across scrolling platforms while the latter moves a space ship, which is firing at asteroids. The real challenge is to play for more than a minute without dying of boredom or wanting to saw your head off, though.

Early review units included no peripherals, but a basic, wired, proprietary keyboard and mouse come with the AE1900. The keyboard looks quite classy but is rather rattly to type on. Alternative desktops include ASUS's Eee Top, which is smaller and more expensive and BenQ's nScreen, which doesn't have the touchscreen or optical drive. You can also pay a lot more for HP's excellent TouchSmart computers, which are much more powerful and classy.

All in all, the Wind Touch is good value for something designed as a second PC for somewhere like the kitchen. While not overly exciting, it is a good, reasonably-priced 'terminal-style' PC that may well prove attractive.

Nick Ross



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2009 TIPA

www.fujifilm.com.au/digital

SUPER CCD EXR

FUJIFILM

Dell Inspiron 545s

5/10

Inexpensive, but not good value.

Dell
www.dell.com.au
$1,410

Looks good with colour. ✔

Could be cheaper; could be smaller; could be more powerful. ✖

SPECIAL FEATURES
Slim form factor
Customisable configuration
Two-year onsite warranty

The new 545s is a slim version of the 545 model. It has a small form factor and is available in eight colours. This, matched with curved corners on the facia, make it very stylish for a low-end desktop. But is it worth buying?

We're seeing more and more cheap desktop PCs appear with netbook-like performance, but this can get frustratingly slow if you want to do anything other than browse the web and do office work. There's a lot to be said for buying a cheap desktop PC with a 'proper' processor inside.

As ever, Dell's online configurator allows you to heavily optimise the specification. Our review sample had a 2.4GHz E2220 Pentium Dual processor, 4GB RAM, 500GB hard disk, Blu-ray player and the Radeon graphics. It scored a mediocre 3,582 in PCMark Vantage but will still perform most tasks thrown at it — though you may have to wait a while for video to encode. The Radeon graphics card only allows old games to be played, but it's transcoding performance is worth having if you plan on watching HD video. It also boosts video connectivity from VGA to DVI plus HDMI.

A two-year onsite warranty is included, although a feature of that is 'remote diagnosis', so it may take time to persuade someone to come out. Even so, it's an impressive standard warranty for the price and few other manufacturers offer anything else like it.

Connectivity includes six USB ports, eight audio jacks and Gigabit Ethernet. In terms of future upgrades, there is only room for two low-rise PCI cards. When operating it makes an audible whooshing sound but it's quiet and unobtrusive.

A basic model is $699, but our spec boosted it up to $1,410. We'd expect a much more powerful processor for that money, and so the value is hit hard.

Nick Ross

Antec Twelve Hundred

9/10

Hefty construction and plenty of space.

Antec
www.antec.com
$330

Great quality; great cooling. ✔

Weight. ✖

SPECIAL FEATURES
Solid construction
Six fans included
11 disk drive bays

Expanding its gaming series of cases, Antec has added the Twelve Hundred model to the lineup. At 582mm tall the case comes as a full tower. The good news is that Antec hasn't just created an empty shell though; instead, it's chosen to really make use of the room by adding a large number of fans.

On the front we have three 120mm blue LED fans; at the back there's two of the same fans while a larger 200mm blue LED fan, known as the Big Boy 200, is included on top.

There is room for up to 11 HDD or optical drives, depending on if you want to remove some of the fans. At the very top of the bays we have a tray that can carry something like a USB key. On top we have two USB 2.0 ports, one eSATA, HD Audio In/Out, and the power button.

At 14.5kg the steel case isn't light — what it does do is help keep the price down, and while $330 without a power supply isn't exactly cheap, it's significantly less than full aluminium towers, which tend to be $150 to $300 more expensive.

The left panel consists of a window that is shaped differently from what we're used to, which shows off the black powder-coating nicely. Installation is a breeze thanks to the massive amount of room inside; here we can also see that Antec has opted to place the power supply at the bottom, which is something we're seeing more often.

If you're a fan of the look and you don't mind spending the money for a quality case, the Twelve Hundred is a beautiful piece of work with some great features and fantastic cooling abilities. While the decision to go steel makes the case a bit heavier, it does help the hip pocket, which is the most important feature to some.

Shane Baxtor

Gigabyte GTX 285 2GB OC

8/10

Tuning the fastest even faster.

Gigabyte
www.gigabyte.com.tw
$599

2GB of memory; native HDMI. ✔

Similar performance to 1GB card; pricey. ✖

SPECIAL FEATURES *i*
2GB RAM
Overclocked out of the box
DVI, VGA & HDMI

This GTX 285 single GPU card has been added to Gigabyte's Ultra Durable VGA range. This model has had a minor overclock to its core clock speed and an increase in memory capacity, moving from the stock 1GB to 2GB.

Something we've seen before in other 2GB GTX 285 cards is a slight down-clock in memory speed, and this card is no different, with the clock speed moving from the default 2,484MHz DDR to 2,400MHz DDR.

To combat this drop there's an increase to the core clock from 648MHz to 660MHz, which in turn increases the shader clock from 1,476MHz to 1,504MHz. While not a massive jump, it's enough to fight the drop in memory speed, due to higher density modules being used.

The bundle lacks any full-version game like we've tended to see with Gigabyte recently. What we do have are all the standard cables to get you up and running, along with a driver CD and manual. Looking at the card, it's a pretty standard setup with a stock cooler and a dual six-pin PCI-E power connector.

Where the card differs is with it's connectors. Instead of a standard twin dual-link DVI setup and single TV-out port, Gigabyte has implemented just a single dual-link DVI connector and an older VGA port, as well as an HDMI connector. If you need two DVI connectors you're still in luck, as an HDMI to DVI connector is included in the package.

The 2GB model offers a serious amount of graphics memory — of course, there's a price increase over the 1GB model, but with similar performance between the two, it might be a bit hard to swallow. If you want the massive amount of memory and like the native HDMI support, the Gigabyte GTX 285 2GB OC is an impressive card.

Shane Baxtor

ASUS HD 4890 VT

8/10

We need more power, Captain!

ASUS
www.asus.com
$459

Great fun; good potential performance; good bundle. ✔

More expensive; not for everyone. ✖

SPECIAL FEATURES *i*
Adjustable voltages

Overclocking can be a mixed bag: while some people simply don't know how to, or feel their product already offers enough performance, others get a kick out of buying something cheaper and overclocking it to run better than more expensive counterparts.

Voltage Tweak (VT) by ASUS is the latest in graphics card technology. It takes overclocking up a notch and gives us the ability to adjust the standard settings and the voltage to hopefully achieve higher clock rates. Looking at the ASUS HD 4890 Voltage Tweak, there's nothing different — included is the standard ASUS bundle, which consists of a number of software extras and a mouse pad, as well as the standard cables to get your card up and running.

Out-of-the-box performance was in line with a stock HD 4890. That all changed though with GamerOSD installed. It gave us the ability to up the voltage to 1.437V from the stock 1.312V, which in turn let us reach a core clock of 1,000MHz (way up from the stock 850MHz). While the memory voltage wasn't adjusted, we were still able to increase the speed from 3,900MHz QDR to 4,444MHz QDR.

These numbers resulted in a boost to performance that made gaming notably better at resolutions like 1,920 x 1,200. While the Voltage Tweak model from ASUS will set you back a little more than a standard HD 4890, it isn't as high in price as an HD 4890 with a stock 1GHz core clock or even a clock in the mid-to-high 900MHz range.

If you're not interested in overclocking, this version isn't for you; a stock model from ASUS would be a better and cheaper option. If you want to be more hands-on and dive into overclocking to achieve clocks that are better than most pre-overclocked cards, the Voltage Tweak model is going to be a great card for you.

Shane Baxtor

Keen to overclock? The Voltage Tweak may be for you.

8/10

ASUS Xonar Essence ST

If on-board isn't enough.

ASUS
www.asus.com
$269

Sound quality; feature set. ✔
An extravagance ✖

SPECIAL FEATURES
PCI connectivity
H6 DAC-compatible

APC MAGAZINE HIGHLY RECOMMENDED

The only name in high-quality sound cards used to be Creative Sound Blaster. As motherboard technology has improved, though, we've seen more companies implement the same sound card technology into their motherboards. But it now seems that ASUS, a company that dabbles in so many areas, is entering the audio industry.

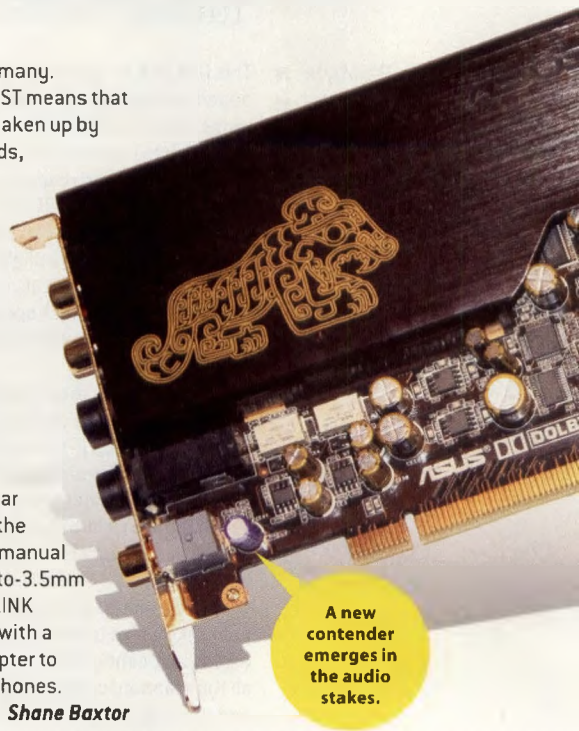
The Xonar Essence ST, while sounding like the younger brother of the multi award-winning Essence STX, isn't really that at all. Included on the PCB are all the features that made the STX so great; where this card does differ though is that instead of using a PCI-E interface we have the older but still common PCI interface.

Something added to the ST, which isn't seen on the STX, is a new header at the bottom of the card allowing for the addition of a H6 DAC expansion card — something that's currently only seen in the HDAV 1.3 Deluxe model. While this has the ability to expand the capability of the card with full 7.1 audio support, it isn't going to be a must for many.

Using the Essence ST means that if your PCI-E slots are taken up by graphics and RAID cards, you don't have to suffer with onboard audio. And while the technology has improved considerably over the years, the features implemented into the Xonar series have expanded too, making for the ultimate sound solution.

Included in the Xonar Essence package are the usual suspects, like a manual and driver CD, an RCA-to-3.5mm Y Cable, an SPIDF TOSLINK optical adapter, along with a 6.3mm-to-3.5mm adapter to support 3.5mm headphones.

Shane Baxtor



A new contender emerges in the audio stakes.

7/10

ASUS Xonar HDAV 1.3 Deluxe

Looking for one of the better home theatre audio cards?

ASUS
www.asus.com.au
$419

Multiple outputs including HDMI and video processing. ✔
Price; software issues. ✖

SPECIAL FEATURES
Dolby Pro Logic and DTS Interactive for simulated surround sound

At $419 for a sound card you would expect something amazing. In this case you get a surround sound audio card with every output you could wish for, including HDMI and a Splendid HD 1080p video processor chip.

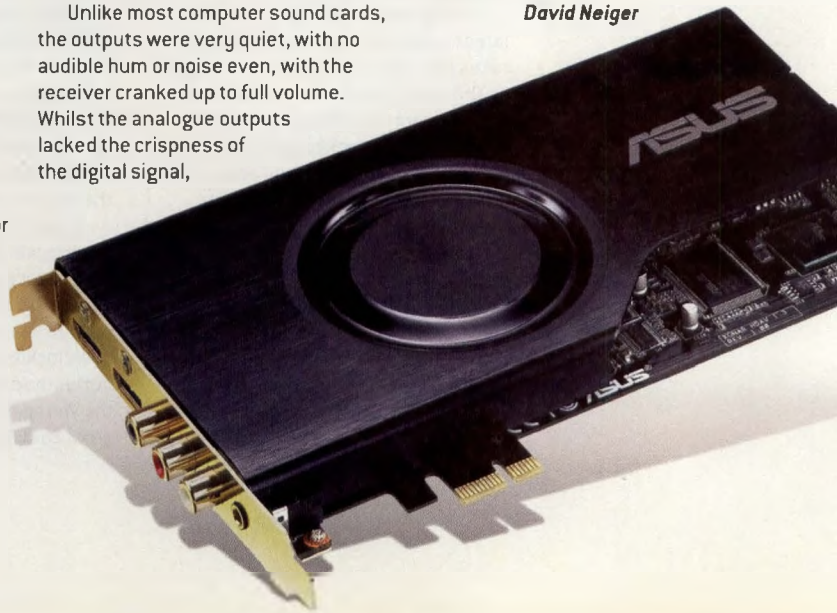
The card is designed for the serious gamer or for integration into a Media Centre PC, so it does require some computer experience to set up and configure properly. You need a PCI Express slot, an additional slot for the analogue connectors and a separate power line. Thankfully, all of the connectors you need are in the box, including the DVI to HDMI loopback (for your video card) and HDMI connector and RCA to 3.5 stereo connectors.

The next step is to install the drivers and ArcSoft TotalMedia Theatre to allow playback of multichannel audio from DVDs and Blu-ray discs. Unfortunately, this is where we encountered problems, because the version of TotalMedia Theatre supplied in the bundle refused to work under Vista (32-bit). No doubt with tinkering (and downloading updates, patches etc.) this problem could be solved, but without this software, audio is limited to stereo output from Microsoft Media Center.

Unlike most computer sound cards, the outputs were very quiet, with no audible hum or noise even, with the receiver cranked up to full volume. Whilst the analogue outputs lacked the crispness of the digital signal, sound quality was close enough that it would be difficult for anyone but the most discerning listener to hear the difference. Very impressive.

Overall, it's a good card if you are prepared to pay the price and deal with software issues.

David Neiger



8/10

LaCie 5big Network

Big storage to suit small offices.

Lacie
www.lacie.com/au
From $1,299 (with 2.5TB)

Easy setup; quiet. ✔
No LCD for status. ✖

SPECIAL FEATURES
Designer style
Network Assistant software
Integrated BitTorrent

APC MAGAZINE HIGHLY RECOMMENDED

LaCie's approach is to deliver both form and function to offer a NAS that delivers market-leading capacity without looking like a truck accessory.

Installation and setup were very simple. The unit ships with Network Assistant software. This little app interrogated our LAN and found the 5big in a matter of seconds. Network Assistant provided a snapshot of the 5big's status and a link to the browser-based configuration window. Options in the configuration software were neatly laid out, without too much jargon.

Installing and replacing drives is a simple affair. Drives are secured to the caddies by four standard hard drive screws. LAN connection is by Gigabit Ethernet and there are three eSATA ports and a USB 2.0 port for connecting external drives.

Unlike many NAS devices, the 5big lacks an LCD or array of warning lights. Instead, when all is well, a large blue light is illuminated. When there's a problem with the RAID, the lamp glows purple. From there it's a matter of going to the configuration tool to check the system status and identify the problem. While this approach made the 5big aesthetically pleasing, it also meant that fault finding couldn't be done without a PC.

After several days of continuous operation we found that the drives were not hot to touch. The 5big keeps the drives cool through good ventilation and strong yet quiet fans.

The 5big supports SMB and AFP sharing as well as FTP and HTTP access. There aren't many systems or circumstances where it can't be accessed. Setting up shares and assigning them permissions was straightforward.

As you'd expect from a high-end NAS, there are plenty of RAID options available. While we'd favour using a configuration that offers some redundancy, the 5big offers RAID 5, RAID 5 plus a spare, RAID 6, RAID 10 and RAID 0. Our unit came with RAID 0, but we rebuilt it as a RAID 5 for testing.

Performance was good. Our test package of files, consisting of 480MB of data in files ranging between 10MB and 200MB, was copied from our test system running Vista to the 5big in just over 40 seconds. The return trip took 25 seconds, which had the 5big's performance ranking about average compared to other units we've tested.

The 5big comes with an integrated BitTorrent client. Configuring a download was easy and, although it was possible to set maximum numbers of download and uploads and limit the upstream and downstream speed, there was no way to schedule downloads.

There's a lot to like about the LaCie 5big Network. It's easy to set up and use, looks great and performs well. Power users might prefer a few extras but, for small offices without an in-house tech or home users needing lots of storage, this is a unit for you.

Anthony Caruana

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Microsoft
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skiing holiday to Canada!

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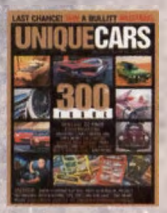

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7/10

AOC Verfino V22 monitor

Thin and pretty, but not all there.

AOC
www.aocmonitor-anz.com
$449

HDMI input. ✔

No DVI. ✖

SPECIAL FEATURES
1,680 x 1,050 resolution
Slim design
2ms panel

Our first reaction when pulling this out of the box was that we must have left something in the box. AOC claims that the Verfino V22 is the thinnest 22in LCD on the market and we don't doubt that.

The Verfino V22 comes in two pieces: a glass base and the main panel. Putting them together requires the use of one screw, but it has a wide head and can be hand tightened. There's no height adjustment, but tilt adjustment was generous. Also, there aren't any VESA mounting points, so this display isn't suitable for a wall or other mounting systems. Although it worked out of the box, there are drivers for the display, webcam and microphone.

Connection options were limited. As you'd expect, the analog connection is via a D-SUB connector, but there's no DVI. Instead, there's an HDMI port. To use that with a PC you'll need an adaptor cable. There's also a USB connector for the mic and webcam and a 3.5mm connector for the integrated speakers.

Performance was a mixed bag. Running at the native resolution of 1,680 x 1,050, the Verfino V22's 2ms panel made light work of most tasks. Photos were bright and vivid and text displayed clearly. When we ran our benchmark application, PassMark's Monitor Test, we found that colour separation, display of grayscales and rendering of diagonals and ellipses were excellent.

However, we did find one anomalous result in the moire interference test, and in some of the test patterns with dense arrays of vertical lines the Verfino V22 exhibited some noisiness. This was particularly noticeable down the left side of the screen. Although it didn't affect normal use, it was a little disquieting.

While there are cheaper 22in displays, there are few that are as attractive as the AOC Verfino V22. It's sleek and slim and delivers very good image quality.

Anthony Caruana

8/10

Thecus N7700 NAS

Warp-speed NAS (if a little on the noisy side).

Altech
www.thecus.com
$2,999
($1,749 without any drives)

Performance; expandability. ✔

Noisy. ✖

SPECIAL FEATURES
Seven SATA drive bays
Integrated download manager
Easy operation

The N7700 is designed for performance, with seven SATA drive bays, a Core 2 Duo processor and 2GB of DDR2 memory.

Setting the N7700 up was very straightforward but did require some understanding of the differences between types of RAID arrays and how to take advantage of user accounts.

Keeping tabs on the N7700's operation was very easy; there's ample information provided through the browser-based configuration tool, and the LCD on the front of the unit provided a rolling summary with simple messages on RAID state, disk health, temperature, fan operation and IP address each appearing for a few seconds at time. Email alerts can also be configured so that the N7700 can tell an administrator of any reboots or other system events.

Given the N7700's specs we expected excellent performance. We weren't disappointed. We copied a 480MB package of files to and from the N7700 using a system with a Core 2 Duo CPU clocked at 2.66GHz and 2GB of memory, running Windows Vista SP1 over Gigabit Ethernet. The largest file in the package was 215MB and the smallest was 10MB. Writing the files took just 9.4 seconds.

As well as being a massive file repository, the N7700 can be used as a web server and supports UPnP, FTP, Nsync and NFS. If you plan to share media files, it can be used as an iTunes or multimedia server.

Rounding out the N7700's capability is the integrated download manager where you can schedule downloads to run at specific times.

The Thecus N7700 is a great NAS. Other than being quite loud, its performance was excellent. Although the configuration UI is a little rough, it's easy to use. For a small office looking to easily integrate lots of storage, it's definitely worth considering.

Anthony Caruana

8/10

NEC LCD3090WQXi

Pro screen with pro pricetag.

NEC
www.nec.com.au
$3,870

Excellent image quality; lots of adjustment. ✔

Generated quite a bit of heat. ✖

SPECIAL FEATURES
VGA, DVI & HDMI connectivity
Zero tolerance policy on dead pixels
Orient the screen any which way

APC MAGAZINE HIGHLY RECOMMENDED

NEC's 30in display behemoth, the LCD3090WQXi, is a heavyweight in every sense of the word. Weighing in at a hefty 19kg, this LCD delivers a monstrous 2,560 x 1,600 resolution. It's able to display a pair of A4 pages or a high-definition movie in a window that takes up just a fraction of the screen.

Setup was simple, there's plenty of height and tilt adjustment, and it can be flipped between portrait and landscape. We'd expect it to be a great workhorse for the office or design professionals. Connectivity is covered off with VGA, DVI and HDMI ports. Image quality was brilliant, with excellent benchmarking results that were backed up in real world testing using a variety of applications. Ellipses and diagonals rendered with very little jaggedness, and colours were displayed faithfully, with the interfaces between adjacent colours clearly delineated. Video playback was excellent.

Rated at 6ms, the LCD3090WQXi easily kept up with fast-moving video. We couldn't see any ghosting when watching live action movie or animation.

The only criticism we found was that the LCD3090WQXi generated quite a bit of heat. The air escaping from the vents at the top of the screen may be an issue for those working in a confined environment. NEC's dead pixel policy is very solid. The screen will be replaced if there are any dead or stuck pixels during the warranty period. This level of support is what you'd expect from one of the dearer units on the market.

With a premium price tag, the LCD3090WQXi delivered excellent image quality. The ability to connect just about anything and orient the screen makes the NEC LCD3090WQXi a very flexible beast.

Anthony Caruana

8/10

BenQ M2400HD

Not just a good looker.

BenQ
www.benq.com.au
$420

Connectivity; image quality. ✔

No height adjustment. ✖

SPECIAL FEATURES
HDMI, VGA and DVI
Full 1080 HD resolution

APC MAGAZINE HIGHLY RECOMMENDED

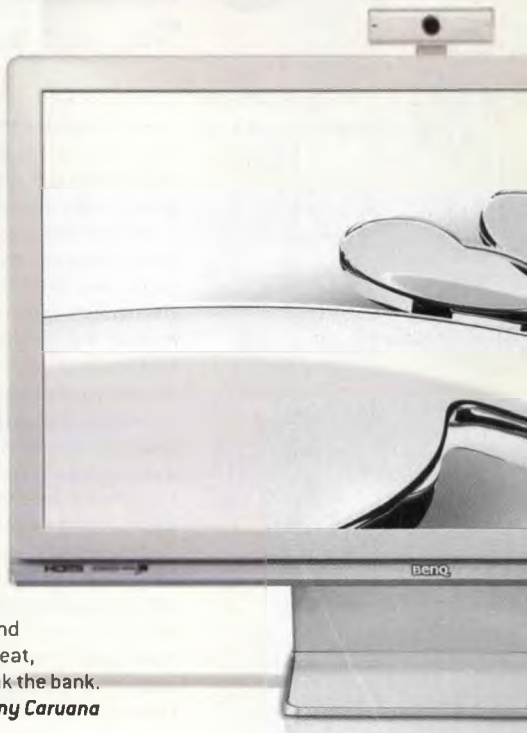
With its faux aluminium and white finish, the BenQ M2400HD is a very attractive display. The bezel and curved stand are backed up with a panel that delivers a very nice picture with even colour distribution. The M2400HD is one of a new generation of displays — rather than the full 24in, a new form factor of 23.6in is emerging. The M2400HD delivers DVI, VGA and HDMI connectivity with an optimal resolution of 1,920 x 1,080. This is a true 16:9 ratio rather than the more common 16:10 ratio. It's a good choice for the small office, where a PC often has double duty as a work tool and entertainment device.

Tilt adjustment was generous but there was no height adjustment, and the screen was limited to landscape mode. Benchmarking revealed that the M2400HD was excellent at rendering obliques and arcs, delivering some of the best results we've seen. Colours were bright and clear but the moire test revealed some flashing, suggesting that it might not be the fastest panel on the market. This was surprising given that the panel is rated at between 2ms and 5ms, although fast-moving video sequences rendered very nicely.

In a variety of office tasks, the M2400HD proved to be a reliable workhorse. Text was displayed clearly, with typefaces as small as 6pt easy to read. Photos also looked very good. BenQ's LCD Monitor Defect Policy covers you for three years from the date of purchase. The warranty comes into effect when there are three stuck pixels or five dead pixels or a total of five defective pixels.

There's plenty to recommend the BenQ M2400HD. It looks great, performs well and it won't break the bank.

Anthony Caruana



8/10

Sony Z5500 52in LCD TV

Look under P for Premium.

Sony
www.sony.com.au
$5,199

✔ Natural colours; great HD and SD quality; smooth motion.

✖ A bit pricey; occasional buffering aberrations.

SPECIAL FEATURES
- 200Hz Motionflow
- 52in display
- Bravia Engine 3

The Z5500 inserts three artificial, in-between images between every frame to smooth out motion judder. Most LCD TVs with similar technology use a 100Hz system to insert only one extra frame.

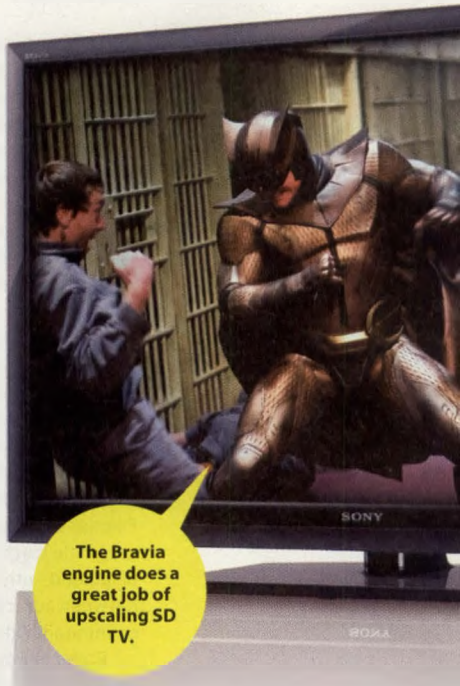
Colours are vibrant but not overpowering and skin tones are all neutral. Contrast is very good but we've seen better from plasma and Sony's XBR LCDs (with rear-mounted LED lighting — the Z5500 uses standard fluorescent tubes). This TV's Bravia Engine 3 is the best we've seen at upscaling SD TV. Objects are sharp and surrounded by virtually no noise or jaggies. Many competitors offer great HD but really struggle to upscale SD. The Z5500 can't rescue poor-quality broadcasts like SBS' overseas news, but it still displays it with few aberrations. HD TV looks great. Watching Blu-ray movies was a joy, and the Motionflow makes sport look great.

After reviewing a string of ultra-thin TVs it was refreshing to hear some real speakers again. The Z5500 offered both volume and punch while keeping vocals distinct.

There are plenty of inputs, including four HDMI ports, and the remote is well featured and responsive. The image can be tweaked extensively, but we rarely needed to. DLNA networking is supported and a USB port lets you playback media directly.

A few Motionflow buffering aberrations aside, this is a superb TV with one of the best all round pictures we've seen. It's expensive, though: Sony's 46in W Series Bravia is $700 cheaper than the 46in Z Series, which is a lot for relatively little difference. Ultimately, this is one of the best TVs on the market, and its almost-unique, top-end motion smoothing feature means it's not bad value.

Nick Ross



The Bravia engine does a great job of upscaling SD TV.

7/10

Samsung Series 7 LCD

Not just a pretty face.

Samsung
www.samsung.com/au
$4,699

✔ Looks stunning; good HD performance.

✖ Poor speakers; slightly-soft upscaling.

SPECIAL FEATURES
- LED backlighting
- 3cm-thick
- 100Hz motion

Samsung's Series 7 LCD TVs have been heavily advertised over recent months. They're super thin, look highly desirable and our 46in test unit garnered many jealous looks from visitors.

It's this thin because of LED backlighting, but the backlighting isn't particularly even. You'll hardly notice when watching full-screen colourful content, but you will when watching anything with letterbox bars: the light at the sides and corners leaks through.

Image quality is generally very good, with vibrant colours. HD performance was particularly impressive and the 100MHz motion smoothing prevents most juddery movements.

People and objects could look a bit soft if an HD broadcast was low quality. But good-quality transmission looked incredibly sharp. With SD TV we were impressed. There were a few interlacing artefacts in some scenes, although, in fairness, it depended on the broadcast.

Using the HQV benchmarks, we found noise reduction and de-interlacing images with particularly-fine detail mediocre, although its motion-smoothing performance was excellent. There were hardly any jaggies visible with HD. Watching *The Dark Knight* at 1080p/24 on Blu-ray showed good contrast, with detail being visible in dark and light areas. However, it lost its dramatic edge (even in Movie Mode) due to hyper-realism. There were still a few aberrations in fine detail during panning shots.

Overall, despite great looks, better quality can be had for less.

Nick Ross

The LA46A750 offers great quality but is overpriced.

5/10

LG W2442PA HD Monitor

Good monitor for desktop entertainment, but that's all.

LG Electronics
www.lge.com.au
$699

1080p; HDMI input. ✔

Poor sound; no 24p support; no analogue video inputs; failed HD playback tests. ✖

SPECIAL FEATURES
HDMI
Built-in speakers
Switchable aspect ratio

At around $699 (less on the street), the LG W2442PA is a cost-effective alternative to a Full HD TV, particularly if you only need a smaller set without a TV tuner. As an HD monitor, the W2442PA looks promising, as it has HDMI, DVI and VGA connectors, supports HDCP (for full HD Blu-ray playback) and even has built-in speakers (albeit small and tinny). The other feature that sets the LG W2442PA apart is the switchable aspect ratio. It is light enough to easily move and small enough to fit in a bedroom or study.

The W2442PA does a great job of brightly and clearly displaying graphics. The upscaling engine is very good, so you don't need to use the native 1,920 x 1,080 resolution to obtain a sharp image, and the switchable aspect ratio allows you to connect up older PCs that use lower resolutions for retro gaming. As an HD display unit, the W2442PA supports standard-resolution (480 and 576i/p) and high-resolution (720p, 1080i and 1080p) modes but not 24p, which you need for optimal Blu-ray movie playback.

The picture looks fine but can be grainy and noisy. We tested the W2442PA using the Silicon Optix HD Benchmark test disc and it failed noticeably. The image processing engine was unable to deal with noise, which is why the picture was grainy and lacking detail.

It was also unable to process moving high-resolution images properly, showing a strobing pattern rather than fine black and white lines; the smoothing of diagonal lines also left a lot to be desired.

As a computer monitor it's great, but don't be fooled into thinking you are getting a high-definition display at a bargain price.

David Neiger

9/10

Sharkoon X-Tatic Digital 5.1

If you want six speakers in your ears.

Bronet
www.bronet.com.au
$275

Sound quality; digital; multi-platform support. ✔

Heavy; expensive. ✖

SPECIAL FEATURES
5.1 headphones
Dolby digital support

APC MAGAZINE apc EDITOR'S CHOICE

Over the last few years we've seen 5.1 setups get smaller and smaller. We're now at the point where you can have that setup literally on your head with this pair of Sharkoon X-Tatic Digial 5.1 headphones. Sharkoon is a relatively new company to the sound industry.

Its headphones are 5.1, support Dolby Digital and support multiple platforms from the PC to the Xbox 360. As far as cables go, we have a USB cord, convertor to analogue ports and a mic. There is a cable to connect the headphones and your Xbox 360 controller so that you can use the microphone functionality with your console.

Another feature of the set is an amp that offers support for Dolby Digital. The amp also has analogue plugs along with an optical port giving us digital connectivity; this is where the support for consoles like the Xbox 360 and PS3 come in, with both offering an optical port. Of course, if you have optical on your sound card, you can make use of the digital connectivity on your PC, too.

With four speakers in each ear piece, an included amplifier and digital connectivity, the headphones perform well above expectation, with crisp, clear sound felt from the correct directions along with a good amount of bass that doesn't overpower the other speakers.

The 5.1 headphone setup has come a long way; no longer do we have massive headphones, and while the Sharkoon set is a bit on a heavy side, the padding across the top is excellent and helps reduce the overall heavy feel of the headset. Simply put, this is one of the best headsets on the market and shows just how far 5.1 headphone technology has come.

Shane Baxtor

8/10

Panasonic DMR-BW850

One-of-a-kind high-def functionality, if you can afford it.

Panasonic Australia
www.panasonic.com.au
$2,199

Full featured Blu-ray recorder with all the bells and whistles. ✔

Price; no analogue tuner. ✖

SPECIAL FEATURES *i*
H.264 encoding
7.1 channel high-def audio
Internet access

We loved the old BW-500 Blu-ray recorder and Panasonic has taken everything that was good about it and made it even better. Although the BW850 still sports a 500GB hard drive and dual digital tuners like its predecessor, it now makes use of H.264 encoding to further compress digital recordings to allow you to squeeze up to 240 hours of high-definition content onto its hard disk. If you prefer HD as broadcast (without additional artefacts), then you can still record around 72 hours.

The Ethernet port can now be used for something other than just downloading updates, as the BW-850 can access the internet to download BD-Live content as well as YouTube and Picasa web images via the proprietary Viera Cast walled garden portal.

Other enhancements will please audiophiles, as the BW850 now fully supports 7.1 channel high-definition audio in Dolby TrueHD, DTS-HD High Resolution and DTS-HD Master Audio, which can either be output as a bitstream or in its native format if you have a suitable receiver. The Blu-ray recorder also supports DivX playback including DivX on demand (DivX DRM content), although this content is limited. Add the fact that the unit also supports high-definition camcorders (that use AVCHD) and you have an effective media hub.

Our only gripe is that this unit still does not support streaming media from a PC or Mac (either using Windows Media, iTunes or even DLNA).

If you have the money, there is very little to dislike. Picture and sound quality are excellent (via HDMI 1.3), the unit is easy to set up, and this is still the only device that allows you to record and keep high-definition video content without using a computer.

David Neiger

7/10

Altec Lansing Octiv AIR

In the market for an iPod streaming solution?

Altec Lansing
www.alteclansing.com
$799

Good sound; easy to add additional speakers. ✔

Price; limited display on speakers. ✖

SPECIAL FEATURES *i*
Proprietary 2.4GHz signal
Remote control
Multiple speaker capacity

This is a wireless solution to allow you to stream music from your iPod or analogue audio device around your house. The system comprises a wireless dock for your iPod, a separate speaker unit and infra-red remote control.

The wireless dock acts as a charging base for your iPod as well as providing an inbuilt FM radio and connections for an analogue sound source (such as a CD player or computer audio). Setup was a simple matter of plugging everything in, selecting the appropriate base for your iPod and turning on the speakers.

The system uses a proprietary 2.4GHz signal which claims to be able to go through walls and work up to 30 metres. In our experience we could easily cover several rooms of a house but the signal would deteriorate if it had to pass through several brick walls.

The sound quality from the speakers is very good. Even though the speakers are not physically large, they deliver a well-balanced sound with very good bass response and crisp and clear treble. Multiple speakers can share a single dock, allowing you to fill several rooms with sound without having to cable, although extra speaker units are not cheap.

Each speaker unit includes a remote control to select the input source, tune FM radio stations and select songs from the iPod. The inbuilt display shows the volume and source but not the song title or other information. Control of the iPod is limited to advancing or going back one song at a time, which can be tedious.

The unit isn't cheap but, neither is the sound. Although, we would have expected better control over the iPod and a more comprehensive display.

David Neiger

8/10

Patriot G Series 6GB Kit

High-performance, with mainstream pricing.

Patriot Memory
www.patriotmemory.com
$249

Price; overall performance. ✔

Relaxed timings. ✖

SPECIAL FEATURES *i*
Active cooling
1,600MHz clock speed
6GB bundle

While 2,000MHz memory is the big sell at the moment, there's no denying that for most people this is simply unnecessary because they aren't interested in achieving such a high clock speed (or think that the price of these kits is just ridiculous).

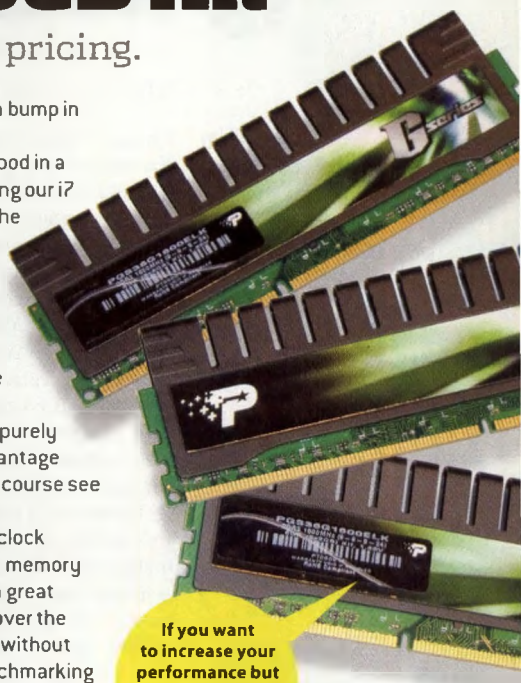
If you want to overclock without going too crazy, PC3-12800 memory (1,600MHz) might be a better option. At the same time, if you're happy with some more relaxed timings, like the 9-9-9-24 that Patriot have here, you can get yourself a 6GB kit of memory for less than half the price of lower-latency 2,000MHz counterparts.

The G Series kit from Patriot carries with it a nice heatsink that does a good job of keeping the modules cool, thanks to the lower clock speeds and higher timings. For this reason, Patriot hasn't had to include an active cooling solution, which is something we see in most 2,000MHz kits; while the extra fan does help keep the modules cooler, the biggest feature these coolers bring is a bump in the price tag.

Performance on the kit is good in a real-world environment. Keeping our i7 920 at 4GHz, and seeing how the kit performs at 1,600MHz 9-9-9-24 against a 2,000MHz 8-8-8-24 shows the higher-clocked modules perform only slightly better, with the only difference being about a single FPS most the time. Looking at synthetic tests though, which purely test the memory and take advantage of every MHz on offer, we do of course see the 1,600MHz kit fall behind.

If you want to increase the clock speed of your CPU and give the memory a bit of a bump, PC3-12800 is a great option: you get the extra MHz over the standard PC3-10600 modules without the insane price tag; but if benchmarking is the most important feature, 2,000MHz modules are still a great buy.

Shane Baxtor



If you want to increase your performance but aren't fussed about massive overclocks.

7/10

Fuji Xerox DocuPrint C2120

A workhorse colour laser.

Fuji Xerox
www.fujixeroxprinters.com.au
$879

Workhorse colour laser printing at a reasonable price; Ethernet as standard. ✔

Duplexer is an extra-cost option; secure print function requires RAM upgrade. ✖

SPECIAL FEATURES *i*
PostScript standard
Job accounting and control

What you see is what you get with the C2120: a workhorse colour laser printer for workgroups. Some buyers might use the USB 2.0 interface, but we'd expect most to opt for the standard 10/100 Ethernet connection.

Installation and setup was smooth. We like the long mains cable and built-in circuit breaker, which are practically Fuji Xerox trademarks. The cartridges are delivered in place, so all you need to do is remove the sealing tapes. If you have trouble following the setup guide, there are animated instructions on the CD.

The software is basic: a PCL driver for Windows, and PostScript drivers for Windows and Mac OS X. Configuration and management is through a web interface.

The Auditron feature controls which users are allowed to print in colour, and to limit the pages a user produces. These restrictions are enforced at the printer, with no feedback to the computer.

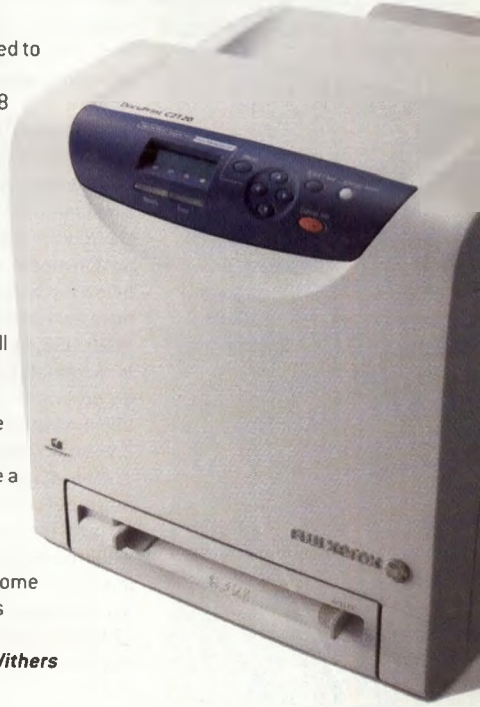
The front panel's two-line backlit LCD is easy to read, but we hardly needed to use it thanks to the web interface.

The nominal printing speed of 18 pages per minute (20 for mono) was achieved with a second-page time of three seconds in our business document test. As usual, the first page took longer, but 16 seconds is still reasonable and just one second longer than Fuji Xerox claims.

Text was smooth and sharp at all sizes, and colours were bright but not excessively so. The toner isn't particularly glossy, which helps the overall appearance. Photos looked good as laser printing goes, despite a slightly brown cast.

A solid black print showed noticeable banding across the page, and the 'leathergrain' we've come to associate with laser printers was apparent but not excessive.

Stephen Withers



8/10

Kodak Zx1

A new breed of cheap point-and-shoot high-definition camcorders.

Kodak
www.kodak.com.au
$299

Affordable; durable design; HDMI connectivity and bundled cable. ✔

SD card included; microphone picks up unwanted noise; buttons look overly complicated. ✖

SPECIAL FEATURES *i*
Still visible in sunlight
Straightforward design

Bridging the gap between mobile phone video recorders and full-featured consumer camcorders, the Kodak Zx1 is aimed at those wanting to record HD video without blowing the budget. Its hardware design is straightforward: control buttons and a 2in LCD display on the front, a lens on the back, mono microphone at the top and rubber-covered ports on the sides for HDMI, USB, charging and the SD/SDHC card slot. There's also a threaded tripod mount on the bottom and a removable battery cover (for two AAs).

The display is small, but it does the job and holds up well in strong sunlight. There aren't many settings to master — mainly video size (VGA, HD at 30fps and HD at 60fps) and switching to the 3MP digital stills mode — but the buttons are poorly labelled. We can appreciate that Kodak was going for a futuristic theme, but save for the prominently-placed record button, it just makes it look more complicated to use.

The ZX1 records in H.264 MOV at 1,280 x 720 pixels, and you can expect up to 20 minutes of video per GB. There's only a miniscule amount of internal memory, so you'll need to buy an SD card separately. The quality of audio was a pleasant surprise; its built-in microphone records in mono (with no facility for an external microphone), and it's very sensitive. Annoyingly, it's so sensitive that it'll pick up the sound of pressing on the zoom buttons while you're recording.

Video quality is on par with where it's situated in the market: colours are natural-looking and the sensor adjusts well to different lighting conditions, but it's not as sharp or detailed as what you'd get on a conventional HD camcorder. Still, for a device of the Zx1's size and pricetag, the videos it can produce are impressive.

Jenneth Orantia

7/10

Samsung HMX-H100p

Shoot movies and stills on the go.

Samsung Australia
www.samsung.com.au
$1,199

Great lens; 4.7MP stills; use of SSD memory. ✔

Battery placement; lack of manual; touchscreen. ✖

SPECIAL FEATURES *i*
Decent stills camera
Schneider lens
Fast startup

This camera is full-blast HD, with a resolution of 1,920 x 1,080, and it also takes decent 4.7MP stills. The Schneider lens is respectable. The f rating is 1.8~2.5 and there is a 10x optical zoom. The 2.7in LCD is flip out and touchscreen-based. There is sadly no viewfinder. Physical controls are at a minimum with a left-to-right rocker for the zoom, single-shot photo button, a switch mode (record playback) button below the tiniest LED indicator lights I have ever seen and a hidden hatch for HDMI, USB, DC in and composite out. Immediately to the right is the record on/off switch. Underneath the flip out LCD are buttons for flash, "Easy" mode, anti-shake and display.

The images were as good as any other camera I have tested in this price range. A lot of that would be down to the Schneider lens, but the electronics play a part too. In these days of 10MP-plus still cameras, 4.7MP doesn't sound like it would cut the mustard, but for average use it is more than effective. Megapixels, like digital zoom, are a definite case of more does not always equal better.

Playback via HDMI to hi-def footage was a delight to watch but to edit it, you need a PC with some grunt. There is no add-on shoe for a mic or flash unfortunately. Power consumption is minimised with the SDD, but this is slightly offset by the touchscreen.

So, the bottom line; would I buy it? For what I do it is a good package. HD, SDD card-based, fast start-up, good picture, a better than average still camera and with a good LCD. Negatives are the lack of a proper manual, bottom-loaded battery, touchscreen (but that's just me) and average editing software.

David Hague

Orbit Downloader 2.8.11

7/10

Play online media when off the grid.

Innoshock Team
www.orbitdownloader.com
Free

Fast downloading. ✔

Poor documentation; fragmented user experience. ✖

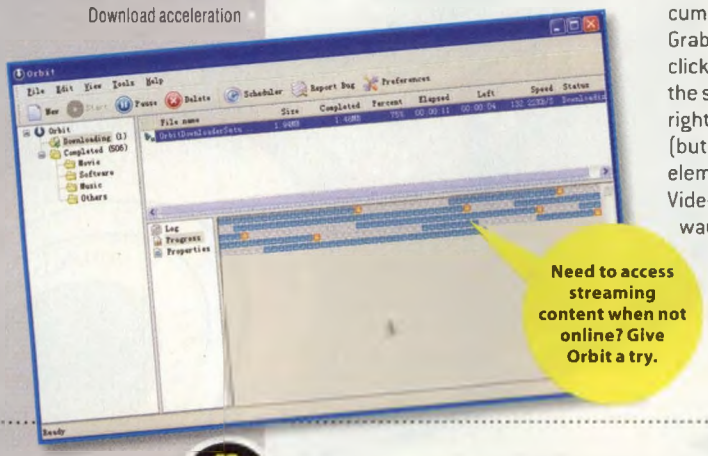
SPECIAL FEATURES
Grab or download media files
Download acceleration

There are some very good reasons for wanting to download streaming media, and most of them revolve around wanting to play the content while you're offline. Tools such as Orbit Downloader are thus very handy.

The idea is that you start playing the content in a web browser as usual, and then click the GetIt button that appears when you roll the mouse over the item. Orbit then stores the video (etc.) as a file, which you can then play at leisure — or transfer it to a compatible mobile device.

Orbit claims to support Internet Explorer, Firefox, Maxthon and Opera. We tested it with IE 8 and Firefox 3, and found the GetIt button only showed up in the former.

According to the help pages, using Orbit with Firefox is a more cumbersome procedure involving the Grab++ feature and multiple mouse clicks. But while experimenting with the software, we discovered that if you right-click on a page containing a video (but *not* on the video itself or any Flash element), one of the choices is Grab Video by Orbit. That seems to be the way to go.



This highlights what we consider to be the program's biggest weakness: poor documentation.

When we tried to grab a video from Yahoo! Music, Orbit failed to download anything despite following the instructions carefully. But we persevered, and found some documentation for the Grab Pro feature that did give the desired results.

One area where the program lives up to its claims is in download acceleration. Orbit can download a file in a fraction of the time taken by a browser. Even with relatively short clips where the time taken to respond to the save dialog is significant, Orbit completed the download in less time than it took the browser to buffer half of the video. And that was without using the P2P capability that can speed downloads, in addition to the automatic use of mirror sites.

This performance is also useful when downloading large files from services such as YouSendIt — we downloaded a 10MB file in 26 seconds, compared with 47 seconds in Firefox.

Stephen Withers

Revo Uninstaller 1.83

8/10

Steps toward a clean machine.

VS Revo Group
www.revouninstaller.com
Free

Thorough cleanup of unwanted programs. ✔

Unstructured lists of files can make selection tedious. ✖

SPECIAL FEATURES
Remove software when uninstaller fails
Additional clean-up utilities

If you make a habit of trying out different programs, it's very likely that one day you'll try to uninstall one of them and the operation will fail. And it's a racing certainty that even if the uninstaller works, it will leave behind various pieces of digital detritus.

While it isn't too big a deal to hunt through the usual places to manually remove now-unnecessary subfolders, locating and removing the application's registry keys is more of a problem. Revo Uninstaller overcomes these difficulties and provides additional tools besides.

There's no need to start by using Add or Remove Programs in Windows' Control Panel — Revo Uninstaller's minimum level of operation simply tries the application's own uninstaller. Safe mode follows that up with a basic scan of the Registry and the hard drive for any residue, while Moderate and Advanced modes apply progressively more rigorous scans for leftover data.

Even the deepest scans only took a minute or two in our testing, although that would probably vary according to the amount of information in the Registry and on the hard drive.

Revo Uninstaller sensibly starts by creating a restore point, and — apart from the effects of the normal uninstaller — doesn't actually delete anything without the user's say-so. The results are shown in an Explorer-style hierarchical list for Registry keys and in a flat list for files and folders.

We used Revo Uninstaller to clean up several stubborn programs with success and no (apparent) ill effects.

The Hunter mode lets you uninstall by dragging a gunsight icon onto an application's window or its icon in the Start bar. You can't drag it onto a program icon that's inside a folder, as that window belongs to Explorer. Hunter mode can also be used to control items in the System Tray, for example to stop them loading at startup. There's also a separate Auto Run Manager.

The Tools button provides convenient access to various Windows tools (eg. Disk Defragmenter) along with Revo's own utilities, such as secure deletion, junk files removal and browser cleaning.

All told, this is a very useful addition to your utility toolkit.

Stephen Withers

UNDER REVIEW

MEGA-CHEAP MEGAPIXELS

Not everyone wants to spend a fortune on a new DSLR. **Christopher Zammit** looks at the best-value cameras under $300.

As recent reader feedback has demonstrated, not everyone wants to spend over a thousand dollars on a quarter-of-a-kilo DSLR in order to take photos of their kids at the playground. DSLRs are big, bulky and never seem to fit into anything but their own specially designed carrier bags without difficulty. Granted, a DSLR will give better results than the average compact, but for the non-professional user, the benefit does not warrant the cost.

With advances in digital compact technology, the average camera user now has access to functions and technology that was — until recently — only available in the most expensive cameras. Innovations like face detection and image stabilisation have put DSLR functionality into the hands of compact camera users. Paired with 10+ megapixel CCD sensors that are identical to those in mid-range DSLRs, the performance-to-price ratio of the cheapest compacts has grown enormously. Now is the time to grab yourself a digital camera that is both cheap and good.

We've tested the best of the cheapest digital compact cameras on the market right now. Take your pick.

What do I look for?

In a good compact digital camera. . .

In the sub-$300 price range there are certain features and functions that are a must. Not that they are essential to taking a good image; more that they are essential to getting a good deal.

PRICE

Anything more than $300 and you're most likely paying for features you won't want or need.

MEGAPIXELS

Look for at least 10 megapixels in this price range.

BATTERY

AA batteries are popular at this price range. Although they are convenient to replace, they represent an ongoing (and unnecessary) cost. Where possible, grab yourself a camera with a rechargeable Li-Ion battery to save even more cash.

FUNCTIONS

Face detection, red-eye reduction and image stabilisation are must-haves that will improve your image quality. Everything else is just a gimmick or a luxury.

ISO AND SENSORS

Like megapixels, ISO has settled into an average and 1600 is it. Minor variances in sensor specs and shutter speeds will make little or no difference to image quality.

Canon PowerShot A1000 IS

@ www.canon.com.au
✔ Viewfinder; good quality pics; simple.
✖ LCD screen is a little lo-res; average action shots.

The Canon A1000 has something that you won't see on many compact cameras nowadays: an optical viewfinder. While not seen as essential to most users, those of us who grew up using film cameras will feel more comfortable shooting with a viewfinder rather than a screen.

Another physical anomaly shared by the Canon A1000 and the Canon E1 is the battery bay that holds two AA batteries and doubles as a handgrip. Although small, it does at least attempt to make the camera more comfortable and more stable to use. On the outside, all the A100's buttons and dials are nice and large and are clearly (and intuitively) labelled. With everything kept simple, there's little reason to access the menu system except for when it's necessary to change the autofocus priority, adjust the LCD brightness, or turn the image stabilisation on or off.

With image stabilisation, face detection and widescreen capture, the A1000 takes great pictures in good light that should satisfy most users. Colours are nicely saturated, giving them a more professional look. On the downside, images tend to have a little more contrast than desired and tend to lose sharpness during action shots. As long as you watch out for fast-moving objects and stay out of the dark, the A1000 does the job well.

Canon PowerShot A480

@ www.canon.com.au
✔ Cheap; easy to use; takes decent pics.
✖ A bit plasticky; a little slow.

Up until this roundup, the A480 was the best budget compact in our Best Tech pages. As you'll see from the competition, we've had to re-evaluate its score.

The A480 is exactly what you'd expect from a good budget compact. The camera has basic low-end camera specifications with a few of the newer functions thrown in for added value. Face detection is becoming more common and is a welcome inclusion, while users may enjoy more of a benefit from 'motion detection', which adjusts the cameras settings to reduce blur in action photos. A good addition, and a must for compacts, is red-eye correction, which is not included on many models.

The A480 takes a good photo as long as you don't set your expectations too high and your needs are modest. Sharpness and details are good at the centre of the image but tend to slip towards the edge of the pictures, where they can be slightly grainy and blurred. This is only minor and is made up for by the A480's excellent colour reproduction. The A480 looks good but has a slightly plasticky feel to it, especially around the control surfaces on the rear. The LCD is a decent size but, as expected, it is fairly low resolution. The A480 is not a bad camera, but there are others that offer better quality and value.

Canon PowerShot E1 IS

@ www.canon.com.au
✔ Viewfinder; good pics; good design; solid feel.
✖ A bit chunky; only takes AA batteries.

Here's one for the girls. Canon has gone for the ladies with a 'designed by women for women' approach to the E1. Smooth curves and pastel colours abound, giving the camera a feminine touch without looking toyish. Like the A1000, the E1 has a good, solid body that has a good feel and weight to it — unlike the A480 (left), this doesn't feel like a toy.

What is essentially a re-packaged A1000 IS for women, the E1 has everything that its 'male' counterpart has. Image stabilisation, red-eye reduction, motion detection and the all-important face detection technology, which works in conjunction with the autofocus, exposure, and white balance systems to optimise all three for the best possible portrait shots.

Although aimed at the beginner, the E1 gives a choice of 16 different dedicated scene modes if you don't want to shoot in full auto. A 10-megapixel CCD and 4x optical zoom lens, which is equivalent to a 35-140mm lens on a 35mm camera, offers good-quality images over a great shooting range.

Like the A1000, image quality is good, minus a few minor flaws that are expected in this price range. If you're after something for your daughter's birthday or just as a snap-away camera for a night out with the girls, the E1 will do the job. . . and then some.

10 MEGAPIXELS
FACE DETECTION & STABILISATION MODE
2.7IN LCD DISPLAY

$199

6/10

Fuji FinePix J20fd

@ www.fujifilm.com.au
✔ Good image quality; great shutter speeds.
✖ No image stabilisation; lacks features.

The Fuji FinePix J20fd has a slim body that feels nice and thin in your pocket. Jammed inside its 17.4mm frame is a 3x optical zoom lens offering a range from a wide-angled 36mm to a 107mm (equivalent) telephoto.

Conspicuously absent is any form of mechanical image stabilisation. Fuji has instead gone with a "Picture Stabilisation mode" which, sadly, doesn't have the same results. The standard (but good) ISO maximum of 1600 is here along with a great high shutter speed of 1/2,000 of a second that gives more range when taking action photos. Although the J20fd has no optical viewfinder, it does have a 2.7in LCD display with a great 230,000 dots of resolution.

As with many models at this price, the Fuji J20fd doesn't offer a lot in the way of manual controls, instead focusing on simplicity and ease of use. With multiple focusing modes and the aid of the ever-popular face detection function and red-eye removal, the J20fd takes a lot of the guesswork out of photography. Automatic scene recognition (SR Auto) enables the camera to recognise six types of scenes and optimise the ideal exposure, focus, white balance and ISO for each. With decent images for its price, the J20fd is a good alternative to more expensive models, even if it lacks a few features.

10 MEGAPIXELS
FACE DETECTION & WIRELESS CONNECT
2.7IN LCD DISPLAY

$275

6/10

Fuji FinePix Z200fd

@ www.fujifilm.com.au
✔ Wireless connectivity; auction mode for web pics.
✖ Average picture quality; too many flaws for price.

Fuji has gone down a different path with the Z200fd. For a slight increase in price they have included a few new functions to woo in customers. Along with the now-standard face detection, which on the Z200 gets its own dedicated button at the top of the camera, Fuji has added the ability to perform wireless image transfers via an infra-red sensor. Gone are the days of plugging your camera into a USB port. A special mode allows users to take pictures specifically for eBay (via the Auction Scene mode), which optimises pics for the web.

Sensor-based image stabilisation takes the place of the more impressive mechanical versions as seen in the Kodaks and Nikons.

Fast focusing in both its standard and macro modes makes it faster than other models, but, sadly, despite all the bells and whistles, the image quality doesn't benefit from all these extra functions. Colours aren't as accurate or as bright as its competitors, nor are the images as sharp. Exposures are fine, and in good light images are reasonably sharp, but detail is soon lost as the light levels fade from optimum conditions. At the higher end of our price range you're paying for new and fancy functions at the expense of image quality. Although image quality is not terrible, you can do better for the price.

9.2 MEGAPIXELS
FACE DETECTION & BLUR REDUCTION
2.7IN LCD DISPLAY

$180

9/10

Kodak M320 EasyShare

@ www.kodak.com.au
✔ The cheapest; good image quality; rechargeable.
✖ Control dial is a bit awkward.

As the cheapest camera in our sub-$300 roundup you'd expect the M320 to have something wrong with it. Well, we're happy to report... it doesn't.

As we've mentioned in the past, a higher pixel count doesn't equate to better images. While it only has a 9.2-megapixel sensor (compared to 10MP of most of the others), the M320 takes some great pictures in daylight but tends to suffer from noise in lower light, just like its more expensive competitors. Colours were a little on the warm side, but not in any way that it would be a problem. If anything they give the pictures a warmer feel.

The Kodak EasyShare M320 doesn't have any dedicated manual features. Instead, it relies on 17 scene presets, auto exposure metering and adjustable white balance. A range of ISO sensitivities are also offered along with face detection and motion detection, which work as well as any we've tested.

One quirky design innovation that will come in handy is the location of the battery compartment and SD-card slot in the side of the camera, instead of underneath. This should be useful if you're a tripod user.

The M320 is the cheapest but it performs as well as the best, plus, it has a rechargeable Lithium-Ion battery. Nice!

Kodak M340 EasyShare

@ www.kodak.com.au
✔ Still bang for buck; quality all-round.
✖ Not much more for the extra cash.

The Kodak EasyShare M340 is hard to distinguish from the EasyShare M320. Both cameras sport a 3x optical zoom lens and a 2.7in LCD screen, along with most of the same modes and features (including 17 scene modes and the much sought-after face detection). The only real differences in the M340 are a slightly higher pixel count (10.2 vs 9.2) and the inclusion of an automatic scene selector called "Smart Capture". We struggled to see what difference the latter made.

The other main difference is in a slightly smaller body with an updated and unconventional button layout — which has seen the playback, menu and delete buttons placed along the LCD's lip (where they make more sense). Otherwise, not much has changed really.

When it came to image quality, the Kodak EasyShare M340 gave a similar performance to the EasyShare M320. Intelligent capture control automatically sets camera settings, including exposure, focus and ISO for clear, sharp pictures even in low light and challenging situations. Inbuilt video capability (same as the M320) and inbuilt software makes filming and uploading to YouTube a simple process. For $60 extra, you don't get much except a different button layout, so you may as well go with the M320.

Nikon Coolpix L20

@ www.nikon.com.au
✔ 3in LCD; glossy look; modes; so simple to use.
✖ Takes some user control away

The Nikon Coolpix L20 has the lot. Motion detection for action shots, in-camera red-eye fix that adjusts the image data before it saves the image and the ever-popular face-detection, which can detect and balance as many as 12 faces in a shot.

The L20 also has a smile mode, which activates the shutter when it 'sees' somebody smile — this is either a blessing or a curse depending on your tastes, as it does take some control away from the user and can be unreliable. As a backup, blink warning will notify you if it detects somebody within the frame blink, so that you can retake the shot.

As you can see, the L20 has the beginner in mind, so the scene auto selector comes as a welcome addition, as it eliminates the need to manually select a scene mode to match the shot. Just point and click and it's all done for you.

With all this at hand, it's no surprise that image quality is first-class for the price-range. Colours are vibrant, with sharp, well-defined details. Lens distortion is minimal, with little motion blur. Furthermore, the Nikon Coolpix L20 features fast processing speed, allowing for less lag in taking a shot (as long as you autofocus before taking it). With a raft full of positives, this is one camera with very few negatives. Excellent!

Nikon Coolpix S220

@ www.nikon.com.au
✔ Heaps of features; easy to use
✖ Pictures look a little soft when larger than 6 x 4in.

If you're after something with a lot of features to help you get decent family snaps, then the S220 fits the bill. . . barely. This 10-megapixel camera is pretty well loaded with everything you could want including shake reduction, smile recognition and even a blink-proof setting that takes two shots in quick succession to avoid the problem of someone closing their eyes at the wrong moment.

The metal body feels solid and is a well-constructed (and sexy) looking piece of digital bling that looks a lot more expensive than it is. Controls are simple, with a four-way controller which provides shortcuts to self-timer, flash, exposure compensation and macro modes.

A problem with some cheaper cameras (with cheap lenses) can be image distortion. The S220 gets around this with an anti-distortion setting that gives you more natural-looking pictures. It's a shame about the overall image quality though, as the S220 takes good, bright photos that for some reason come out looking a little soft when viewed at large sizes. This by no means makes it a bad camera; it's just not for users who want larger-sized prints. For general web use, or for those who like to print 6 x 4in album prints, this might not be a problem, but if you are seeking large prints, look elsewhere.

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Nikon Coolpix S520

@ www.nikon.com.au
✔ Panoramic capability; acceptable images.
✖ A bit overpriced; too few features.

Looking very similar to the slightly cheaper S220, the S520 is one of the oldest cameras in this roundup. The controls are laid out in the standard clickpad and four buttons arrangement with a zoom rocker button that could have benefited from being a little larger. The zoom itself is one of the smoothest we've seen though.

A major concern is the location of the flash, which has been placed directly above the lens; this is just asking for red-eye problems, even though it has inbuilt red-eye reduction.

There are 16 scene modes that vary from the useful to the useless — food mode anyone? A cool addition is the panorama stitch mode, which allows you to combine multiple shots into one wide image, all done in camera. Handy for the computer-illiterate, or those of us without photo-editing software.

As in other Nikons, face detection can automatically seek out and focus on up to five faces and remember their positions, so you can zoom in and check their focus in playback mode. An ISO of 2000 adds a little extra range to the camera but not enough to give an obvious benefit. Picture quality is good but not exceptional (as you'd expect from the most expensive camera in the roundup). Frankly, for the price, there are better — and cheaper — alternatives available.

Olympus FE-3010

@ www.olympus.com.au
✔ Heaps of good features; smart; good images.
✖ Controls could be bigger.

The appeal of the Olympus FE-3010 is inside the camera. Intelligent Auto combines reading from a variety of inputs to determine the correct scene settings, exposure times, white balance and filters to get the best automated results for its price range. Pair that with face detection for sharp portrait pictures and in-camera help guides for the ultimate learn-as-you-go digital experience and it's easy to see why the 3010 is poular with digital newbies.

A rechargeable Lithium-Ion battery is a welcome addition for added convenience, and the innovative inclusion of an LCD backlight boosts viewing capability in bright light.

Digital image stabilisation freezes the action with high ISO sensitivity and fast shutter speeds to help prevent blurry images often caused by a moving subject. While not as good as mechanical image stabilisation, the FE-3010's system works better than most.

When you add in direct uploading capability to YouTube and web sites, going online becomes so much easier.

Image quality is great for the price, with little distortion and rich, well-balanced colours. Even low lighting conditions are well handled with above average results. If you're after good-quality images that are achieved with minimal fuss and have a little extra to spend, then the Olympus FE3010 is for you.

Panasonic Lumix DMC-FS4

@ www.panasonic.com.au
✔ Low power use; Intelligent Auto; brilliant pics.
✖ No shake reduction.

A lot of added extras have gone into this thin and light body. Intelligent Auto ensures you're always shooting in the right mode to suit the situation, while Intelligent ISO does a good job of making sure you get the best exposure with as little noise (grain) as possible. Face detection takes care of getting your human subjects in focus using an impressive 9-point autofocus system that you usually only see in DSLRs. This ensures that your subject will come out sharp no matter where they are in the frame.

The FS4 can shoot continuously through its three aspherical lenses at three frames per second, which is blindingly fast for a digital compact, especially at this price. Image quality is impressive, with images containing fantastic tones and a broad dynamic range that give the impression that they came from a much more expensive camera. Noise is well controlled right up to ISO 800, which handles all but the darkest situations.

The only let-down is the lack of shake reduction in the FS4. The Intelligent Auto and 9-point autofocus does a lot to ensure crisp images at standard focal lengths, but images tend to suffer without it when zooming. The FS4 still gets a Highly Recommended award though.

Pentax Optio M60

@ www.pentax.com.au
✔ High ISO; great face detection.
✖ Slow; looks like a toy; no image stabilisation.

Sometimes manufacturers can make things a little too light and use just a little too much plastic for their own good, giving the product they're trying to sell the look and feel of a kid's toy rather than a serious bit of tech. The Optio M60 suffers from both of these. Although the body feels solid and has a protrusion on the front that serves as a finger grip and a textured area on the back for your thumb, the over-use of plastic makes it look cheaper than it actually is. That's a shame, as the control layout is sensible and well spaced out, and the camera handles extremely well.

To top it all off, the M60 has no image stabilisation and there are no manual exposure options, plus the zoom range of 36-180mm lacks the ability to shoot in wide-angle situations.

But... (and there *is* a but) it does offer tracking AF, an improved face detection that can detect 32 faces, blink detection, a full range of metering options and the highest ISO setting in this roundup (6400 ISO).

There's a choice of 24 shooting modes including automatic scene selection. Image quality is acceptable, with no major problems apart from the M60 being painfully slow, especially in the focusing department. There are a lot of good points here but sadly they are outweighed by the bad.

Samsung Digimax PL50

@ www.samsung.com.au
✔ Great colour; handy night mode.
✖ A bit slow; focusing is a bit iffy.

Samsung also has its eye on new users, with its dedicated 'help' mode, which tells you what actions you need to take when your shots are out of focus, or what setting you should use when shooting in low light. Basically, it shows you how to use all of the camera's features and even lets you have a practice run.

As for the PL50's performance, its autofocus had trouble fixing on anything until face detection was activated. Problem solved... provided you have people in your photos. The same goes for the image stabilisation; without it, pictures tend to come out a little soft. So the rule here is: leave all the fancy functions turned on and you'll be alright.

The exception is the smile shutter, which is a bit unreliable — a smile the size of the Joker's would probably fail to set it off. There is a blink shutter, too, which can inform you if your subjects blink, and this works, but for some strange reason it can't be used simultaneously with the smile shutter — it's either one or the other.

Taking photos in low light will produce noisy images, as the camera automatically selects a high ISO speed. Photos taken in good light have great colours and the night mode produces amazing results. This is an all-round good camera, but it has too many quirks to make it a choice that we'd recommend.

Sony Cyber-shot DSC-S950

@ www.sony.com.au
✔ Intuitive functions; instructional mode; quality.
✖ Minor colour issues.

First-time camera users won't be confused by the S950's simple shooting menus and a choice of six commonly used scene selection modes. There's also an easy shooting mode, where basic instructions are displayed on the LCD screen and the camera switches to all automatic settings so you can just take the picture without worrying about it.

Enhanced Face Detection can track up to eight faces in a scene, fine-tuning focus and exposure for more accurately exposed photos. Sony's SteadyShot image stabilisation compensates for camera-shake by capturing two photos at high shutter speeds and combining them into a single clear image. It sounds like an odd way to go about it but it works a treat.

In-camera retouching tools allow users to retouch and enhance their photos with trimming and red-eye correction functions.

A high ISO of 3200 ensures that photos are capable of being taken in poorer lighting conditions with less noise. Daylight images are clear and free of distortion. Colours are accurate but can look a little cool in shadow areas. This is only a minor issue that is easily adjusted using the supplied image editing software. The S950 is a quality piece of gear that looks, feels and performs as if it should cost a whole lot more than it does! APC

DIGITAL RADIOS

10 years after its announcement, digital radio has arrived, but what's the big deal, and should you upgrade? **Jenneth Orantia** finds out.

After over ten years of testing in Australia, digital radio has finally gone live. If you live in the metro areas of Sydney, Melbourne, Brisbane, Adelaide or Perth, you can tune into the digital signal with a DAB+ compatible radio. As with digital TV, there are no subscription costs or accounts to sign up for — everything is transmitted over the airwaves like regular radio.

The advantages of digital radio are similar to what you get with digital TV: better reception, a clearer signal, more channels and extra data to accompany each channel. The first two are probably the main perks: unlike analogue transmissions, which attenuate over distance and are prone to interference, digital radio automatically selects the strongest transmitter in the area and sounds equally clear across the entire coverage area.

Or that's the party line, anyway. In reality, digital radio does drop out occasionally, and there are black spots within the coverage area where you won't be able to get any reception. Rather than get a fuzzy signal like you do with analogue, the signal usually just drops out altogether on digital radio.

Commercial broadcasters and the ABC and SBS are simulcasting their shows on analogue and digital, and there are a few digital-only radio stations that cover particular niches, like NovaNation (a 24/7 dance music channel), Radar (a channel dedicated to unsigned artists) and ABC Jazz.

HOW DOES IT WORK?

AM radio listeners in particular will notice a big improvement in clarity and reception, and FM stations may get the benefit of superior audio quality, depending on the bit rate used by the broadcast (see 'Sound quality' below). Not that the bands have any significance in digital radio, as there's no split between AM and FM anymore: all of the stations are on the same VHF Band III spectrum (the same spectrum used by analogue TV) in the 174-230MHz range.

While analogue radio stations take up a whole frequency (like 104.1 for 2Day FM), multiple stations can occupy that same frequency on digital by way of multiplexing. Broadcasters have been given 128Kbit/s for each of their analogue stations; by splitting that allocation, broadcasters have been able to introduce new digital-only stations. As an example, Austereo split its 128Kbit/s allowance for 2Day FM into two 64Kbit/s stations: 2Day and Pink Radio. Now that multiple radio stations can be found on the same frequency, the old paradigm of memorising radio station numbers (and using the frequency dial to find a station) has been thrown out the window in favour of a digital listing. Stations are listed in alphabetical order by name, and you can browse through them using the radio's LCD display.

SOUND QUALITY

The term 'CD-quality' is being used to describe digital radio by many of the industry spokespeople, the radio stations and the manufacturers, but it does in fact sound like compressed digital music. The sound quality differs between stations depending on the number of kilobits that it uses for its broadcast. It's the same principle as behind MP3 files: the higher the bit rate, the better the sound quality.

There's a noticeable quality difference between shows broadcasting at 64Kbit/s and shows at 128Kbit/s, but you won't find many stations using the latter bit rate. Out of the digital stations in Sydney, only 2GB broadcasts at full 128Kbit/s. Many of the talkback shows on SBS go as low as 32Kbit/s, but the average seems to be between 64-80Kbit/s. These allocations aren't set in stone, so while some stations will constantly broadcast at the same bit rate, other

stations will fluctuate depending on the program. The quality boost between AM analogue and the same station on digital is immediately obvious, but whether FM stations sound better on digital is open to debate. Flicking between the FM and digital broadcasts of Nova (which broadcasts a 64Kbit/s stream), for example, showed markedly better quality on the former, with a much fuller and warmer sound that was also louder using the same volume level. But with headphones on, we could hear crackle in the background of the analogue station, whereas on the digital broadcast it was completely clean.

DIGITAL RADIO EXTRAS

DAB+ can transmit data streams alongside the audio. The bit rate used by each station includes both audio and data, which means a 64Kbit/s stream is more likely a 40-56Kbit/s audio stream and the rest is reserved for data-casting. This is used for things like song names, breaking news, weather forecasts, discussion topics and phone numbers for calling in, and appears as scrolling text on the radio's LCD display.

In the future, this will also be used for richer content like electronic program guides and image slideshows, but none of the current digital radios support it. Like digital TV, you can pause and rewind live digital radio, but not all of the devices support this functionality. Out of the 12 DAB+ radios we got in for testing, only the Pure Evoke-2S offered this function.

WHY ARE THEY SO EXPENSIVE?

As with any electronics, prices will drop over time. DAB+ radios are pricier than a regular analogue radio simply because they're more sophisticated. The DAB+ chip inside the radio works as a decoder for converting the digital stream into sound and correcting any transmission errors, and it also interprets any of the program-associated data and multimedia and outputs it on the digital radio's LCD display.

As it's a relatively new technology compared to other digital radio standards, there aren't many devices — or manufacturers — that support it. At present it's limited to desktop radios and iPod speaker docks, with one portable in-car solution (the Pure Highway). Limited adoption around the world also plays a factor; the only other countries currently using the technology are Switzerland, Malta and Italy.

This is in stark contrast to DAB — the standard that DAB+ is based on — which is being used or trialled in over 20 countries around the world. This is why you can find a greater variety of devices

STREAM IT?

You don't actually need a DAB+ receiver to hear all the Aussie radio stations in digital. All of the stations can be streamed from their respective web sites over the internet, not to mention the thousands of other radio stations around the world that have free live streaming. Which then begs the question: why would you bother with an expensive DAB+ radio when you can stream it all from your computer for free? The simple answer to that is internet radio isn't actually free, unless you don't pay for your internet connection. Streaming radio over the internet on a regular basis can chew into your monthly data allowance pretty quickly, unlike digital radio, which doesn't cost anything to tune into. 2Day FM's 64Kbit/s stream, for instance, consumes 28MB an hour. Listen to that for two hours a day, and you'll hit over 1.5GB a month.

AM I COVERED?

The metropolitan areas of Sydney, Brisbane, Melbourne, Adelaide and Perth are currently covered by digital radio. To check if your suburb is covered, you can enter your postcode on the Digital Radio Plus web site (*www.digitalradioplus.com.au*).

Those waiting for digital radio in regional areas will have to wait a little longer. According to Commercial Radio Australia's CEO, Joan Warner, the hold up is due to the Federal Government rather than lack of interest by regional broadcasters. "We have started discussions with the government regarding the allocation of spectrum. Regional broadcasters have unanimously agreed that they want to roll out digital radio, but before any planning can start or timing be announced, the Federal Government has to publically state that a spectrum will be made available to regional broadcasters."

What do I look for?

In a digital radio. . .

PRESETS

Digital radio makes it much easier to move between different stations, as they're all listed by name rather than frequency. But having dedicated preset buttons for each of your favourite stations makes it easier still. For radios with an FM receiver, the presets are usually split 50/50 between analogue and digital stations.

HEADPHONE JACK/LINE OUT

A 3.5mm headphone jack is standard for private listening, but if you want to connect the radio to your Hi-Fi speakers, or record shows for later listening, also look out for a dedicated line out port.

DAB+ COMPATIBLE

Be wary of buying digital radios from overseas. You'll find no shortage of cheap DAB-compatible radios from online vendors, but these won't be compatible with DAB+ unless they specifically say so. All of the DAB+ radios in Australia have a blue Digital Radio + sticker on the box to guarantee compatibility.

AM/FM RECEPTION

All of the commercial and ABC and SBS radio stations are broadcasting in digital, but community stations have been pushed back due to delays in federal funding. Most digital radios also include an FM receiver, but you'll have to look around for one that includes an AM receiver — none of the ones we tested had one.

POWER

Since DAB+ isn't available in MP3 players or phones yet, your best bet for portable digital radio is a compact desktop unit that runs off batteries. These can typically run off AC power or batteries.

SIZE

Currently, DAB+ radios are available in small desktop sizes, as AV tuners for stereo systems (which require an amplifier and speakers to function) and as portable in-car devices.

that are compatible with the DAB standard, including car stereos, MP3 players, mobile phones and USB adapters. Unfortunately, DAB isn't compatible with DAB+, although you'll find that most of the DAB+ radios sold in Australia also support DAB transmissions.

HOW DOES IT COMPARE TO DAB?

DAB+ operates similarly to DAB, but it uses a different compression technology. DAB uses the older MPEG-2 codec, which was the most efficient technology at the time the standard was created, but it has since been improved on by codecs in the MPEG-4 family. DAB+ uses a particular variant called High Efficiency AAC v2 profile (or HE-AAC v2 for short), which combines the same AAC codec used on iPods and iPhones with extra technologies like spectral band replication and parametric stereo that maximise bandwidth.

Using HE-AAC v2, DAB+ can produce the same perceived audio quality of DAB at a third of the bit rate. Other benefits of DAB+ versus the original DAB standard include greater geographical coverage, better protection against transmission errors in data streams, a shorter 'zapping' delay (the time it takes to switch from one radio station to another) and the ability to broadcast in surround sound — provided that both the broadcaster and the radio receiver supports it.

BUY NOW OR WAIT?

Unlike analogue TV, there's no switch-off date for analogue radio (yet), so there's no huge rush to go out and buy a digital model. Whether it offers enough extras to justify the expense is the question.

Next to the clearer signal, extra channels on digital radio are potentially a big drawcard for encouraging users to upgrade to a digital radio. The stations vary between cities, but in Sydney there are only eight digital-only stations: ABC Dig Radio, ABC Jazz, ABC Country, Radar (a channel for playing unsigned artists), Pink Radio (a station dedicated to the artist Pink, likely to be replaced with something else when it stops running in August), NovaNation (a dance music channel) and Koffee (a chill-out mix of music).

The major community radio stations are still waiting on federal funding before broadcasting in digital, and there's a six-year moratorium on any new digital-only radio networks entering the space. There's still a fair bit of spectrum available for the current digital broadcasters to introduce new stations, but as they've only been given a set amount of spectrum (128Kbit/s per analogue station), it'll be at the expense of the sound quality of their existing stations.

The other consideration is whether to wait for radios that support the multimedia capabilities of DAB+. At present, all of the current radios have a two-line mono display for showing the name of the station and scrolling text information like song names, breaking news, feedback phone numbers and discussion topics, but to display graphics and things like electronic program guides, you'll need a radio with a larger, colour screen.

UNDER REVIEW

Chronos iDock

Grundig GDR710DABiP

Grundig GDR700DAB

Pure Evoke-2S

Revo ibLik Radio Station

Revo Pico

Revo Uno

Roberts Ecologic 4

Roberts Sound 53

Sangean DPR-99 Plus

Sangean WFR-1D+

Tivoli Audio NetWorks

Chronos iDock

@ www.pure.com

✔ Advanced alarm clock functions; iPod dock; large display.

✖ Bad viewing angles on screen; fiddly wire aerial; limited remote control.

As an alarm clock, the Chronos iDock can't be beat. You can configure up to four alarms to go off on weekdays, weekends, daily or as a one-off, and you can take your pick from DAB+ or FM radio stations, iPod tracks or a melody as your alarm tone.

Even the snooze is configurable — the large snooze button on the top can be set to give you another five to 60 minutes of sleep every time you hit it.

Also, thanks to the time-transmitting properties of DAB+, you don't have to manually set the time or worry about running late if the clock resets overnight — even winding your clock forward or back an hour for daylight savings is automatically done for you.

The iDock positions itself as a high-end clock radio with iPod and DAB+ functionality, and it certainly looks the part with its smart wedge-shaped design, prominent speakers and four-line LCD display. Half of the screen shows a large digital time display, and the other two lines are dedicated to displaying information for each of the different audio functions.

Unfortunately, the iDock falls short in lots of little ways. The screen has extremely limited viewing angles, so you have to be looking at it head-on to see the display properly — not ideal if you're groggily checking the time from bed.

It uses a wire aerial rather than an antenna, which is a lot more fiddly to set up for full signal reception.

The remote control only offers a subset of the radio's functions — full iPod navigation is included, but you can't access presets, set an alarm or activate the sleep or snooze functions.

Sound quality is average — we were able to get the bass and treble to satisfactory levels using the controls hidden away in the menu, but it introduced heavy distortion over the stereo speakers.

Grundig GDR710DABiP

@ www.grundig.net.au

✔ iPod dock; full function remote control; decent sound quality.

✖ Unattractive; no up and down arrows on the remote; unresponsive remote.

Once you add an iPod speaker into the equation, paying $300 for a digital radio starts to look a lot more reasonable. The Grundig GDR710DABiP is a multi-function speaker that can play FM, DAB+ and iPods. It can also play music off an iPhone, but since the speakers aren't magnetically shielded, you can sometimes get interference over them.

As far as iPod speakers go, the Grundig GDR70DABiP is fairly cheap-looking, with an abundance of glossy black plastic but not a whole lot of style to go with it. A small two-line LCD screen sits on the front, and there's a space in front of the mesh-covered speaker grille to dock an iPod which is flanked on either side by buttons. There's also a headphone jack on the front, and a line-out port and battery compartment on the back.

At the default settings, the sound quality is pretty average — the bass in particular is weak, and the treble sounds a little muddy. Thankfully, the GDR710DABiP includes bass and treble controls, and we were able to get great results by boosting both of these.

Moving between FM, DAB+ and iPod (assuming one is docked) is easily done by pressing the Mode button. The bundled remote control includes all of the functions available on the radio, plus buttons for the 10 presets (FM and DAB+ have 10 presets each). It includes menu and select buttons for full iPod navigation, but the lack of up and down keys (it only has left and right arrow keys) makes it a little harder to navigate on an iPod and a lot harder on an iPhone or iPod touch.

We never thought we'd see a Shift key on an A/V remote control, but the small size of the GRD710DABiP's remote means it needs one to double up on functions. More irritating, though, is the remote control's responsiveness — we frequently had to press a button two or three times before it would send the appropriate command to the radio.

Grundig GDR700DAB

@ www.grundig.net.au

✔ Attractive retro design; excellent sound quality; bass and treble controls.

✖ Screen backlight doesn't stay on; no auxiliary input.

For the money, we'd happily recommend the Grundig GDR700DAB as the best-value digital radio. It looks good, sounds great and offers most of the features you'd expect in a mid-range DAB+ radio.

Looks-wise, the Grundig GDR700DAB has an old-world retro charm to it, with its classy wooden panelling and vintage form factor.

While it's the cheapest digital radio in this roundup, it certainly doesn't look it, nor does its feature set or sound quality suggest an entry-level model.

In fact, we'd probably mistake it for a mid-range radio costing a couple of hundred more if we didn't have the spec sheet right in front of us. Sound quality from the 3-watt stereo speakers is excellent for this category, with punchy bass and a lot of detail in the mid-range.

You can also tweak the treble and bass controls by up to six decibels in either direction, and the volume gets extremely loud at full bore.

The Grundig GDR700DAB is also well-equipped when it comes to features. An infra-red remote control lets you access all of the radio's functions from a distance, and there are dedicated buttons for each the 10 presets. It's a bit too big and heavy to use as a portable unit, but it can nevertheless be powered off six C-cell batteries if you're inclined to cart it along with you.

There's no auxiliary input (a shame considering the quality stereo speakers), but there's a line out for connecting it to a Hi-Fi system and a headphone jack for personal listening. All of the GDR700DAB's controls are neatly hidden away behind a fold-down semi-translucent panel below the speaker grille, but you can see the screen through the panel while it's closed. It's easy to use — our only gripe is that the backlight of the screen turns off after a few seconds, so you can't see anything on the screen.

Pure Evoke-2S

@ www.pure.com

✔ Outstanding sound quality; attractive hardware design; pause and rewind.

✖ No remote control; battery pack is separate.

If superior sound quality is your main reason for upgrading to digital radio, you're best off skipping the cheaper units and jumping straight to the Pure Evoke-2S. This desktop digital radio offered the best audio performance of all the radios we tested, with a strong, full-bodied sound that you'd expect from a decent micro Hi-Fi system.

Pure has equipped the Evoke-2S with its ClearSound technology, which consists of custom-tuned mid-range stereo speakers, separate dome tweeters, digital audio shaping technology and Class D amplifiers that deliver an impressive 30W RMS. Everything sounded superb, from the driving bass beats on NovaNation to the talkback radio on 2GB. There's also a 3.5mm auxiliary input and a line-out on the back. Separate RCA connectors would've been better for connecting a stereo system, but the quality of the built-in speakers means you're less likely to miss them.

This superlative sound quality is matched by a gorgeous hardware design. The Evoke-2S is wrapped in a genuine maple veneer, with a chrome carry handle and matching chrome face. Feature-wise, it offers quite a few functions that you won't find on other radios. The ReVu feature lets you pause live radio and rewind for up to 15 minutes, and you can also pause the scrolling text and cycle it back — handy if you missed the start of a news headline or song name. The monochrome two-line display uses OLED technology, so you can see it clearly from any angle, and you can set up to 50 presets each for DAB+ and FM radio.

But the Evoke-2S also misses out on some features that other digital radios in this price range have. It doesn't have a remote control, and doesn't offer any value-add functions like an iPod dock or internet radio access. It can run off a rechargeable Lithium-Ion battery pack (good for around 20 hours), but you have to buy it separately for an extra $99.

SONY

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Revo ibLik Radio Station

@ http://revo.net.au

✔ Internet radio access; wireless music streaming from computer; iPod dock.

✖ No Ethernet port; remote doesn't have full iPod control.

If you don't want to spend more than five hundred bucks and you don't need battery-powered operation, the Revo ibLik Radio Station comes highly recommended. It offers everything you could want in a compact audio device: iPod dock, powerful stereo speakers, DAB+ and FM receivers, access to internet radio stations and podcasts over Wi-Fi and wireless music streaming from a PC or Mac.

Despite the wealth of functions, the ibLik is extremely easy to use. The Internet Radio mode took half a second to find the nearby Wi-Fi networks, and entering a WPA password was surprisingly painless using the three-line display and arrow buttons on the remote control. The ibLik offers access to over 11,000 internet radio stations, and you can browse through stations by location, genre, popular or new stations, and also search by name.

Scrolling through so many stations two at a time (the third line is reserved for system indicators) can get a little tiresome, but the ibLik also lets you browse through stations and podcasts using an online portal. From here, you can assign stations or podcasts as favourites for quick access from the ibLik, and you can also add stations that aren't in the database — it supports MP3, Windows Media and RealAudio streams. Streaming music from a PC or Mac is easy to set up, although it displays the filename for each music track rather than the ID3 tags. It supports a wide variety of codecs including AAC, AIF, RM, WMA and MP3, although it wouldn't play iTunes Plus files. The remote control includes media controls for iPod playback, but, disappointingly, it doesn't offer full iPod navigation control.

The DAB+ function works just as well as on Revo's other products. The display shows scrolling text and other information for each station and there are 10 presets each for DAB+ and FM. The alarm clock function lets you wake to internet radio, DAB+, FM, iPod or a buzzer.

Revo Pico

@ http://revo.net.au

✔ Rechargeable battery pack; stereo RCA outputs; compact and splash-proof.

✖ No alarm clock or sleep function; non-descript design; mono speaker only.

The Revo Pico, named for its compact size, is almost identical to the Uno (following page) save for the fact that it comes with an internal rechargeable battery pack that's good for up to 12 hours away from a power supply.

Whether that's worth an extra $150 depends on how much you value portability. It's certainly compact — about the same size as a desktop computer speaker — and it's got a splash-proof design for outdoor use, but it doesn't come with a carry handle or travel bag.

Compared to its cheaper stablemate, the Pico adds stereo RCA connectors on the back for hooking it up to a sound system, but it loses the Uno's excellent alarm clock feature and sleep function. We preferred the sound from the Uno; the Pico offers slightly louder volume, but the Uno's sound has more presence and depth, with punchier bass and a clearer high-end. Considering the price difference, we would've liked to see stereo sound on the Pico.

The Pico's design is generic compared to the other radios on test, but the functions are logically arranged and labelled, making it easy to find your way around the system. The scrollwheel in the middle works well for browsing through digital and analogue radio stations as well as navigating through the menu system, and items are easily selected by pushing the scrollwheel in. You can scan through FM radio stations by pressing the scrollwheel up or down, but it frequently got the direction wrong, scrolling the other way.

Like the Uno, it shows two stations at a time when you're navigating through digital radio stations. You can assign up to 12 presets each for DAB+ and FM, and these are individually numbered on the remote control for quick access. A flap on the back of the radio hides the power, RCA outputs and headphone jack, and there's a rubber flap on the front for the 3.5mm auxiliary port.

Revo Uno

@ http://revo.net.au

✔ Easy to use; compact size; advanced alarm clock functionality.

✖ Fiddly M-Port function; could be louder.

The Revo Uno offers the best alarm clock functionality in its price range, with the ability to set up to four alarms (which can be configured as one-off, daily, weekday or weekend alarms), an option to play DAB+, FM or a melody as your alarm tone, and both snooze and sleep functions when you need a longer lie-in.

Its cylinder shape is unusual, but we liked how the compact 10.5cm diameter only takes up a minimal amount of space on a table.

All of the buttons are located on the top of the device, and everything is logically arranged and labelled to make it easy to operate without a manual.

It also comes with a small credit card-sized infra-red remote control that includes all of the buttons on the radio plus dedicated buttons for each of the 10 presets. The front of the Uno houses a two-line monochrome LCD display and the 2.25in speaker. The screen shows the date and time while you're not using it, and it's back-lit so you can easily see it in the dark.

When you're browsing through DAB+ stations, the screen shows two stations at time (most of the other radios only show one). The speaker has a decent amount of kick in it — it's loud enough to hear over the shower but it's not party-level volume.

The Uno claims an iPod Speaker System functionality using its M-Port connector, but it's really just a 3.5mm auxiliary line-in that works with any external audio device.

A 3.5mm cable is included in the box, and when it's plugged into the M-Port, the Uno automatically goes into M-Port mode to play music from the connected device — even if there's no audio device actually connected at the other end.

Also — you can't use any of the radio functions until you disconnect the cable.

Roberts Ecologic 4

@ www.robertsradio.com.au

✔ Distinctive retro design; 150-hour battery life; large LCD display.

✖ Redundant up and down buttons; no remote control; heavy.

The Roberts Ecologic 4 has a retro design like the Grundig GDR7000AB, but while the latter looks like the lovingly-maintained 'wireless' that sits pride of place in grandma's sitting room, the Ecologic 4 looks more like the radio that granddad listened to in the garage and brought along on camping trips.

The busy collection of buttons and dials on the top make the Ecologic 4 look intimidating at first glance, but it's actually quite easy to use. Roberts has kept the rotary frequency dial for tuning into stations, and it works just as you'd expect: on FM radio, you use it for manual tuning, and on DAB+ radio, you use it for navigating through the list of stations on the LCD display. But for some reason the radio also includes up and down buttons that perform exactly the same function.

The Ecologic 4 has dials for the volume, bass and treble as well, along with a scattering of blue back-lit buttons below the LCD display ror various functions.

The integrated handle and battery compartment make it an ideal radio for carrying into different rooms of the house, but it's fairly heavy at 2kg — and that's before you load it up with six D-cell batteries.

On the plus side, fresh batteries should last you around 150 hours, making the Ecologic 4 one of the best digital radios for portable use.

It's no slouch in the sound department either. The Ecologic 4's stereo speakers offer a rich, well-balanced sound, and you can pump the volume up loud enough to hear from one end of a mid-sized house to the other. The LCD screen displays two lines, but it's larger than the other digital radios, so the text is bigger and easier to read. In addition to 20 presets (10 for FM, 10 for DAB+), the Ecologic 4 offers a line out for connecting it to a stereo system and a headphone jack, but it doesn't come with a remote control.

Roberts Sound 53

@ www.robertsradio.com.au
✔ Can record radio; plays USB, SD and CDs; iPod playback.
✖ Doesn't show folder or file names for MP3s; no controls on the radio itself.

The Roberts Sound 53 takes the cake as the largest DAB+ receiver in this roundup, but it's actually pretty compact for all the features it's packing. Like the Sangean WFR-1D+, the Sound 53 is designed for slotting into an entertainment cabinet or using as a bedroom stereo, and the inclusion of a wire aerial (in addition to the standard telescoping antenna) makes shelf installation a lot easier.

The Sound 53 is ideal as an all-in-one music player, as it'll play pretty much anything you can throw at it: DAB+ and FM radio over the air, an iPod via the docking cradle at the top, MP3 and WMA files stored on SD, USB or a recordable CD, and standard audio CDs.

It can also record analogue or digital radio stations and rip audio CDs to a connected SD card or USB drive. If it offered a way to schedule recordings we'd be in digital radio heaven, but as it is, the Sound 53 is one of the only devices we know of (and the only one in this roundup) that offers any form of DAB+ recording. The CD ripping feature converts tracks to 128Kbit/s MP3 files, but since it copies the songs in real time, it's not something you're likely to use a lot. Likewise, it doesn't show folder names, track names or even file names when you're playing music off an SD card or USB stick, making it difficult to navigate through stored music files.

The Sound 53 has an extra-large four-line screen, half of which is permanently reserved for the time display. You can only see one DAB+ station at a time when you're browsing, though, which seems a waste of screen space. A large dial below it lets you adjust the volume and turn the unit on and off by pressing it in, and a fold-down panel reveals the SD card slot and USB port. All of the function buttons are relegated to the full-sized remote control, which keeps things uncluttered on the main unit but also means you can't use the Sound 53 at all if the remote control goes AWOL.

Sangean DPR-99 Plus

@ http://sangean.com.au
✔ Relatively cheap; runs off AA batteries; compact.
✖ Slow start up; looks cheaper than it is.

The Sangean DPR-99 Plus could easily be mistaken for an everyday kitchen radio: a good thing if you want a straight-out replacement for your current analogue radio, but not so good if you want it to look as expensive as its pricetag.

Not that it's all that pricey compared to other digital radios — at $279, it's one of the cheapest in this roundup, and as such you won't find any fancy features. It's got DAB+ and FM receivers, a two-line monochrome speaker with a retro orange backlight, and a 2.5in speaker.

The front houses most of the controls, with a rotary dial for adjusting the volume on the right. The five preset buttons let you allocate different presets for FM and DAB+, so you end up with 10 presets altogether across the two bands.

You can flick between FM and DAB+ by pressing the Band button, and scroll through the different radio stations using the up and down keys.

Compared to the other radios on test, the DPR-99 Plus takes an unusually long time to connect to a digital station when you turn it on — up to 15 seconds. FM radio starts up faster at six seconds, but it's still a long delay compared to the instant-on time of most of the other radios. Manually scanning through FM radio frequencies is also slow.

The DPR-99 Plus doesn't come with a remote control or an auxiliary input, but you wouldn't expect such things on a regular kitchen radio either. Then again, you're paying almost ten times more for the DPR-99 Plus than you would for its analogue counterpart, so every extra bit counts.

Its claim of being rechargeable is misleading — it can run off six AA batteries (as well as the standard AC power), but it's only rechargeable if you buy rechargeable AA batteries separately.

Sangean WFR-1D+

@ **http://sangean.com.au**

✔ Large LCD display; powerful sound; net radio and network music streaming.

✖ Doesn't display scrolling text; large; spotty reception.

Dwarfed only by the Roberts Sound 53 (and not by much), the Sangean WFR-1D+ is an imposing piano black unit that's more likely to find a home in an A/V cabinet than a kitchen or on a bedside table. It has about the same footprint of a compact DVD player but is considerably taller at 10.8cm. The reason it's so large is that it crams a lot of tech into the glossy wooden cabinet. In addition to FM and DAB+ receivers, it includes both wired and wireless access to over 16,000 internet radio stations as well as network music streaming from a PC or Mac.

The internet radio and music streaming features are virtually identical to the Revo ibLik as they both use the same Frontier Silicon Venice 6 modules. Even the online portal for adding your favourite internet radio stations and custom stations (run by Frontier Silicon) is the same. The Sangean was able to stream the iTunes Plus music from our Mac, but, oddly, it didn't display scrolling text for DAB+.

On the hardware front, the Sangean includes an Ethernet interface for those that don't have a wireless network, and the six-line display is the largest of the radios we tested. Unfortunately we weren't able to see whether that allowed for different data streams to appear over DAB+, but it does make scrolling through DAB+ and internet radio stations easier, and it also displays more info for internet radio stations. The WFR-1D+'s software can be updated over the network, so hopefully the scrolling text issue is fixed in a future update.

The 3in stereo speakers deliver the powerful sound you'd expect from a device this size; we were especially pleased to find six equaliser presets and custom EQ. The remote control is full-sized with handy shortcuts for the FM, net radio, music player, DAB and AUX-in functions. One thing we weren't too pleased with was the spotty DAB+ reception. While other radios next to it happily played the stations at full signal strength, the Sangean would frequently drop in and out of reception.

Tivoli Audio NetWorks

@ **www.audiodynamics.com.au**

✔ Access to net radio stations; network music streaming; playback from USB.

✖ Mono speaker; odd placement of controls/ports; no custom radio stations.

Fashioned after a luxury Hi-Fi speaker — and with excellent audio quality (albeit in mono) to match — the Tivoli NetWorks is a stylish addition to the home with its solid wooden cabinet and minimal design.

Like some of the other systems in this price range, it can access internet radio stations and stream music from a PC or Mac in addition to receiving FM and DAB+ broadcasts. It's also got a USB port for playing music off a USB stick, and it's a lot more usable than the function offered on the Roberts Sound 53, as it displays folder names and file names on the screen.

When it comes to internet radio and network music streaming, the NetWorks uses the same software as the Sangean WFR-1D+ and the Revo ibLik Radio Station, which means it's easy to set up the connection to your wireless network (it also offers the option for a wired Ethernet connection) and there are thousands of internet radio stations to choose from.

But the online portal the NetWorks uses is a Tivoli Audio-branded one, and you can't add favourite internet radio stations (this has to be done on the radio itself) or even add custom radio stations — the best you can do is submit a radio station to Tivoli Audio and wait for them to approve it so you can access it on the NetWorks.

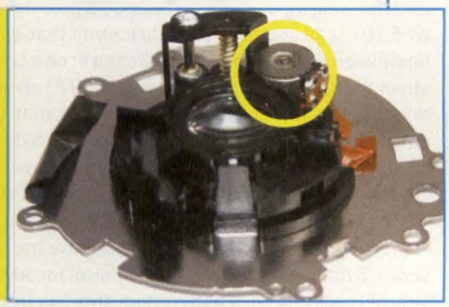
The four-line monochrome display offers ample room for browsing through DAB+ radio stations, but only one line is allocated for scrolling text information. The screen and button on the top (which does triple-duty as a volume dial, power button and snooze) are the only visible controls on the NetWorks — everything else is located on the back and sides. This keeps things neat but also makes it difficult to use without the remote control. Getting to some of the ports underneath like the Ethernet jack and auxiliary input is also tricky. You can add a second speaker for proper stereo sound, but it'll set you back an extra $179.

exploding tech

NO. 38

This month we're exploding the Nikon CoolPix S220 compact digital camera. Packed full of features in a compact body, the CoolPix S220 features in our digital camera roundup, pg 44.

Active autofocus on today's cameras uses an infra-red signal to focus on subjects within six metres of the camera. Infra-red systems use a variety of techniques to judge the distance, including triangulation, the amount of infra-red light reflected from the subject and the time this reflection takes to arrive back at the camera.

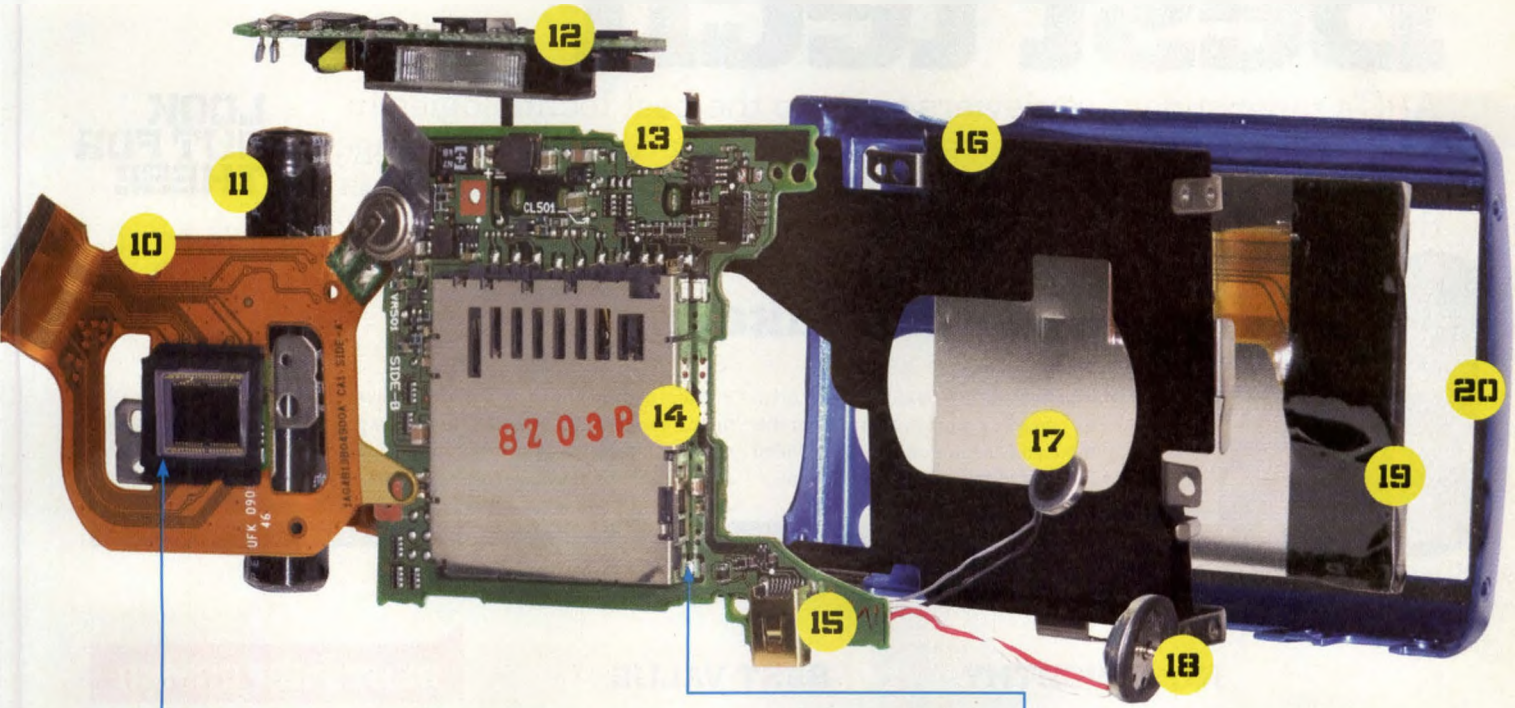


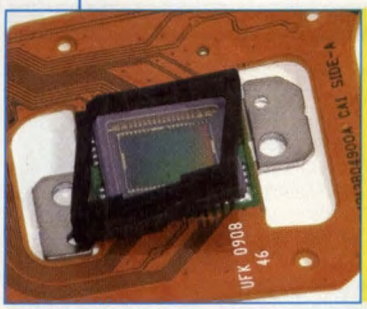
Nikon CoolPix S220

Designed for the beginner, this 10-megapixel S220 is pretty well loaded, with everything you could want including shake reduction, smile recognition and even a blink-proof setting. Electronic VR Image Stabilisation compensates for the effects of camera shake by adjusting shutter speed and ISO setting, while an inbuilt Motion Detection sensor automatically detects moving subjects and adjusts the shutter speed and the ISO setting to compensate for camera shake and subject movement.

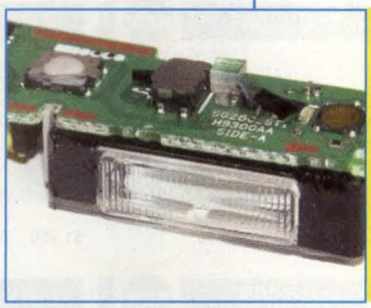
The ability to shoot at a high 2,000 ISO gives brighter results when shooting in low light or capturing fast-moving subjects. For the inexperienced, the Best Shot Selector (BSS) takes up to 10 shots while the shutter is pressed and then saves the sharpest image.

Christopher Zammit





A charge-coupled device (CCD) measures light with a one-centimetre panel of 300,000 to 500,000 tiny light-sensitive diodes called photosites. Each photosite measures the amount of light (photons) that hits a particular point. When the data from each of these photosites is combined, the electrical data can be reinterpreted as an image.



The discharge tube is a lot like a neon light or fluorescent lamp. It consists of a tube filled with Xenon gas, with electrodes on either end and a metal trigger plate at the middle of the tube. Electrons are rapidly moved through the gas in the tube so that when they strike the plate, they react with the Xenon gas to give off a bright discharge of light.

1. Front panel of the metallic body (available in five colours).
2. Shutter-release button and chrome body surrounds, with lanyard attachment.
3. 3x optical zoom-NIKKOR glass lens, f3.1 - f5.9.
4. Rechargeable EN-EL10 Lithium-Ion battery.
5. Battery and SD card bay door.
6. Internal structure that mounts lens mount, main board, flash unit and battery bay.
7. Drive motor for zoom and autofocus of the lens.
8. Lens mount and mechanism for lens.
9. Rear lens and focusing sensor that sits directly in front of the CCD.
10. CCD image sensor that acts like the 'film' of the digital camera.
11. Flash capacitor holds electricity for sudden release to the flash.
12. Flash unit and powerboard.
13. Main motherboard with images stabilisation sensors and SD card slot.
14. SD card slot.
15. High-speed USB port.
16. Insulation panel separating the main board and the LCD.
17. Microphone at the front of the camera for recording sound with video.
18. Speaker for sound playback of video.
19. 2.5in TFT-LCD screen.
20. Rear-body panel.

Best tech

APC's independent reviewers point to the best technologies in the top-selling product categories each month. We only change products when a better one comes along. What you see here is the best technology available on the market right now.

Movers & shakers

What's hot on the gear scene, for every budget.

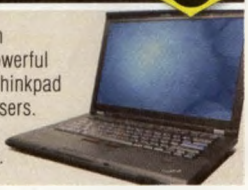
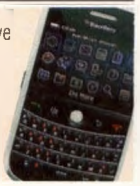
Network attached storage (NAS) is taking off in the home as home PCs start to groan under the weight of thousands of photos and digital video and song files. A NAS takes these off individual PCs and also makes them available to everyone on the network. Our new NAS Home category replaces the Media Centre PCs , a specialist PC category that's slowly becoming extinct.

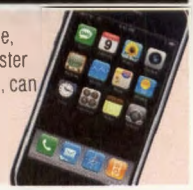
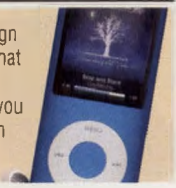
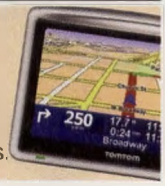
LOOK OUT FOR THESE

NEW

Products marked with this stamp are the latest additions to Best Tech.

	NOTEWORTHY	BEST VALUE	BEST PERFORMER
GENERAL PC	**Acer Aspire X5810** NEW One of the first small-form factor PCs to offer full-size desktop performance, with a Core 2 processor (2.8GHz E7400), 2GB of RAM and a 640GB HDD. $999 > Acer > www.acer.com.au	**TI Deluxe Phenom 810** Great-value system offering both 2D power and 3D performance. This is a PC that is genuinely better value than any Core i7-based machine we've yet seen. Recommended. $1,950 > Trinity International > ticomputers.com.au	**Altech NRG Tornado** Overclocked Core i7, 3GB of Corsair Dominator RAM, GTX 295, two Hitachi 500GB hard disks. You don't get much better value/power than this. $2,999 > Altech > www.altech.com.au
PANEL PC	**MSI Wind Top AE1900** NEW Basically a nettop in a 19in touchscreen LCD , with optical drive too. Handy as a second PC. $1,099 > MSI > www.msicomputer.com.au	**Dell Studio One 19** NEW Dell's iMac for the masses, with a 19in screen. We recommend the 3GB RAM/Pentium E5400 version as a starting point. $1,699 > Dell > www.dell.com.au	**Apple iMac 24 inch** There's better value in PCs, but the 24in iMac's presence is stunning. The 2.66GHz version with 4GB of RAM is best, too costly beyond that. $2,499 > Apple > www.apple.com.au
NAS HOME	**Linksys Media Hub NMH405** NEW Automatically scours your network to find the multimedia files on attached systems, then copies or references them and plays them. $700 > Cisco > www.linksysbycisco.com	**Iomega Home Media Network** NEW When nanna asks you what NAS she should buy, point her to this 1TB NAS designed to store and share images and multimedia across DLNA devices. $429 > Iomega > www.iomega.com.au	**My Book World Edition II** NEW The ultimate backup and media storage for PC/Mac. Up to 4TB with mirrored RAID 1 drives and media streamer and iTunes server. $999.99 > WD > www.westerndigital.com

	NOTEWORTHY	BEST VALUE	BEST PERFORMER
EXTERNAL DRIVE	**W D My Passport Elite** NEW A 500GB portable drive that's fast, looks great and fits in your pocket, and best of all can be picked up for around $250 on the street. **$250 > Western Digital > www.wdc.com**	**Iomega Prestige Desktop** NEW Good-value external drive that gives you an instant 500GB through your USB port. And it looks pretty good as well. **$150 > Iomega > www.iomega.com.au**	**Seagate FreeAgent Xtreme** No RAID mirroring but still gives you one terabyte of storage and FireWire, eSATA and USB 2.0. Extremely fast performance. **$480 > Seagate > www.seagate.com**
NETBOOK	**ASUS Eee PC Seashell 1005HA** NEW The latest notebooks in the Eee PC range, the Seashells have a scratch-resistant "opalescent" plastic frame. XP, 160GB HDD. **$599 > ASUS > www.asus.com.au**	**HP Mini 110** NEW A refresh of the Mini 1000 line with 10.1in screen and 160GB drive and 1GB of RAM. Affordable but feature-limited computing. **$699 with XP > HP > www.hp.com.au**	**BenQ Joybook lite U121** NEW Fantastic machine. A next-gen netbook: amazing battery life, full keyboard, 11.6in screen. Get 2GB of RAM and you'll love it. **$899 > BenQ > www.benq.com.au**
NOTEBOOK ALL-ROUNDER	**Toshiba A500** NEW Big brand, great-value entertainment notebook with a 16in screen, powerful graphics, HDMI connection and built-in TV tuner. **$1,599 > Toshiba > www.toshiba.com.au**	**HP dv2-1001AU** A fantastic offering, melding the price and convenience of a netbook with the powerful hardware and comfort of a fully-fledged notebook. **$1,199 > HP > www.hp.com.au**	**Samsung X460** Thin and light, but with a 2.66GHz Intel Core 2 Duo P9600 processor. 4GB of DDR3 1066MHz RAM, and NVIDIA GeForce 9200M GS graphics. **$2,999 > Samsung > www.samsung.com.au**
DESKTOP REPLACEMENT	**Pioneer DreamBook M57T** NEW Obscenely powerful notebook, with an Intel Core 2 Quad QX9300 Extreme processor running at 2.53GHz and 4GB of 1,066MHz DDR3. **$4,169 > Pioneer > pioneercomputers.com.au**	**MSI EX625** Awesome value with a 16in 1,366 x 768 resolution LCD display and an ATI HD 4670 GPU which packs a 512GB of DDR3 VRAM. Uses Centrino 2 chips and 2GB of RAM. **$1,399 > MSI > www.msicomputer.com.au**	**HP X18** Top-of-the-line portable media centre. With an 18.4in, 1,920 x 1,080 screen, a Blu-ray player, a DVB-T/Analogue TV-tuner and great speakers. **$3,899 > HP > www.hp.com.au**
BUSINESS NOTEBOOK	**ThinkPad T400s** NEW Gloriously thin 21mm) and powerful new T series Thinkpad for business users. Has DVD burner to boot.  **$ 2,899 > Lenovo > www.lenovo.com.au**	**Lenovo's ThinkPad X301** Lenovo's X ThinkPads look the part. The X301 is the latest in the line, with a 13.3in backlit widescreen display, 2GB RAM and 120GB HDD. **$2,924 > Lenovo > Lenovo.com.au**	**Toshiba Portege R600** Full-power business notebook in a netbook shell. Sub-1kg, yet with a 1.4GHz Core 2 Duo, 3GB of RAM, DVD burner and 200GB HDD/128GB SSD! **$3,300 > Toshiba > Toshiba.com.au**
PHONE BUSINESS	**Nokia E63** Great all rounder with amazing battery life (11 hours talk, 18 days standby) superb keyboard and necessary Nokia apps. Has Wi-Fi and 3G. **$399 > Nokia > www.nokia.com.au**	**Nokia E75** Works like a BlackBerry with the new Nokia Messaging push email service. You can configure up to 10 Gmail, Yahoo Mail, Live Mail and other free and hosted email accounts. **$979 > Nokia > www.nokia.com.au**	**BlackBerry Bold** The Bold is the most addictive BlackBerry yet, with built-in Wi-Fi and GPS, a stunning screen and DivX/XviD playback. It's still the best for email too.  **Plan > RIM > www.blackberry.com**

	NOTEWORTHY	BEST VALUE	BEST PERFORMER
PHONE CONSUMER	**Nokia N97** NEW Nokia's flagship, the N97 beats the iPhone with a slide-out QWERTY keyboard and beefy replaceable battery (but let down by dated OS). $1,129 > Nokia > www.nokia.com.au	**Sony Ericsson C510** Unprecedented set of high-end features for the money: HSDPA, Bluetooth, an accelerometer, GPS and custom social networking apps. 3.2MP camera with auto-focus. $389 > Sony Ericsson > sonyericsson.com.au	**iPhone 3G S** Glorious user interface, 3G speed, and now faster CPU, slicker graphics, can shoot video and take better photos.  Plan > Apple > www.apple.com.au
MUSIC PLAYER	**iPod Shuffle** The 3rd-generation shuffle moves the playback controls into the earphones and has voice-over that tells you what song is playing. 4GB of storage carries up to 1,000 songs. $129 > Apple > apple.com.au	**Apple iPod nano** A new long narrow design with an accelerometer that kicks the nano into landscape mode when you hold it sideways. Now in 8GB and 16GB models.  $199 > Apple > www.apple.com.au	**Sony Walkman X** NEW This may be sacrilegious, but we think Sony's new Walkman X is better than the top iPod, with a 3.2in OLED touchscreen, noise-cancelling tech and Wi-Fi. $649 (16GB) > Sony > www.sony.com.au
MP3 DOCKS	**Altec Lansing octiv AIR M812** Unlike most other iPod docks, the dock and speaker connect to each other wirelessly up to 30m away. Produces a warm, well-balanced sound. $799 > Altech Lansing > alteclansing.com	**TDK NX-04CD remote & Mic** Audio performance blows similarly priced docks out of the water, and looks great. But it can also play music off USB drives and SD cards. $300 > TDK > tdk-media.com	**B & W Zeppelin** Simply the best-quality iPod dock speaker system around, even if not the most expensive. So good you need 320Kbit/s tracks to get the most out of it. $1,300 > Bower-Wilkins > bower-wilkins.com
GPS	**Uniden TRAX 430 GPS** Comms company Uniden has released a ripper of a GPS device, impressing with its ease-of-use, exceptional screen and ability to create 3D maps. $379 > Uniden > www.uniden.com.au	**TomTom ONE XL** The most affordable TomTom that delivers the features that matter, with the same display and navigation engine of the more expensive TomToms.  $399 > TomTom > www.tomtom.com	**TomTom GO 930** The top-of-the-line TomTom delivers traffic messaging, intelligent live routing, FM transmitter, voice-recognition and text-to-speech. $849 > TomTom > www.tomtom.com.au
COMPACT CAMERAS	**Ricoh CX1** One of the first compacts with a high-speed CMOS sensor to capture light at faster speeds and wider range of conditions. $599 > Ricoh > www.ricoh.com.au	**Kodak M320 Easyshare** NEW The M320 is cheap, easy to use and produces great images. Takes a picture as well as a camera twice its price. $180 > Kodak > www.kodak.com.au	**Canon IXUS 80 IS** Probably the best digital compact on the market, with every function you could ever need but still at a great price. $379 > Canon > www.canon.com.au

Buying a new PC is smart

	NOTEWORTHY	BEST VALUE	BEST PERFORMER
DSLR CAMERAS	**Canon EOS 50D** Although better than the 450D, the 50D's price stops it being in the Best Value category. Still not as good as the Nikon D90 but still a great camera by any means. **$2,599 > Canon > www.canon.com.au**	**Canon EOS 450D** The best low-price DSLR you can get. Suited to the amateur photographer, the 450D offers heaps of features in a tiny DSLR frame. Bargain! **$949 > Canon > www.canon.com.au**	**Nikon D90** This is just sexy! The first DSLR with HD video, the D90 is the best non-professional camera you could get without sending yourself broke. **$1,699 > Nikon > www.nikon.com.au**
HD CAMCORDER	**Sanyo Xacti VPC-CG10** Looks like a Taser, but shoots hi-def video using MPEG-4 in 1,080 x 720 resolution. Much better cheapie than a Kogan Full HD camera. **$549 > Sanyo > www.sanyo.com.au**	**Sony HDR-CX100E** With the excellent mechanics and HD optics of Sony's new HDR range but with 8GB flash-storage. The most affordable Sony HD. **$1,199 > Sony > www.sony.com.au**	**Sony HDR-XR520V** Want the best consumer camcorder out there? With 240GB HDD storage capacity, 12MP still images and so much more. **$2,699 > Sony > www.sony.com.au**
PHOTO FRAMES	**D-Link DSM-210** NEW 25cm Wi-Fi photo frame that streams net content and can accept content via a "widget" located on the PC desktop. **$499 > D-Link > www.dlink.com.au**	**Kodak P720 Touch Digital** Kodak's entry-level Photo Frame, with a good quality 7in screen and the excellent Quick Touch Border which makes it really easy to navigate menus. **$140 > Kodak > www.kodak.com**	**Samsung SPF-105V** Almost like a mini-TV with an impressive monitor and able to play MP3s and video files, plus lots of slideshow effects. **$399 > Samsung > www.samsung.com/au**
HDTV	**LG PS70** NEW Features in-built "Time Machine" DVR recording. For this model, the PS70, just add a hard disk. **$3,299 for 50in > LG > au.lge.com**	**Panasonic TH-P42S10A 42** NEW Panasonic's plasmas are now great value. This one has a superb picture, uses half the power of traditional plasmas and is Full HD. **$1,800 > Panasonic > www.panasonic.com**	**Samsung Series 9 46in** The first HDTV range to offer live internet content through RSS feeds, plus sophisticated LED backlighting produces blacks to rival plasmas. **$5,999 > Samsung > www.samsung.com.au**
TV TUNER	**Silicon Dust HD Home Run** A networked TV tuner server that allows any PC on your network to access digital television. Cheaper and easier than multiple antenna points. **$299 > Lako Pacific > hdhomerun.com.au**	**Kworld DVB-T 395UR** A basic HD tuner card that allows you to watch HD digital TV on your PC or notebook. It's not flash, but it works well, is portable and convenient. **$79 > Kworld > www.kworld.com.tw**	**Hauppage Nova TD** The Nova TD USB stick has two HD tuners, is designed specifically for Freeview and comes with excellent drivers and software. **$179 > Hauppage > www.newmagic.com.au**

Microsoft

Adding the right software is genius.

Office 2007 Get the ultimate tool for home, school and work.

Buy it for your PC. Office2007.com.au

Microsoft Office

Real life tools.

	NOTEWORTHY	BEST VALUE	BEST PERFORMER
DISC PLAYERS	**Sony PlayStation 3 80GB** Yes, it's a games console, but it also doubles as a Blu-ray player that's as good as any standalone devices on the market. It's the same price as some of the better ones, so do your sums. $699 > Sony > www.sony.com.au	**Kogan Blu-ray Player** Basic, affordable. Plays back good-quality HD and upscales DVDs. Downside is lack of support for BD-Live (Profile 2.0) which means no internet content or firmware upgrades. But at $249 who's complaining? $249 > Kogan > www.kogan.com.au	**Sony BDPS350** Superb HD playback quality and does great upscaling of DVDs to high definition. Unlike the $1,799 Pioneer, available for around $400 on the street. $400 > Sony > Sony.com.au
DVR	**FOXTEL iQ2** If you watch pay TV, the FOXTEL iQ2 is a must. Records both standard and high-definition free-to-air TV to a spacious 320GB hard drive. $10 month > FOXTEL > www.foxtel.com.au	**TiVo HD** The TiVo's smart recording features (such as WishList) are the main reason you'd choose this DVR over the others, despite the fact that it won't record pay TV. $699 > TiVo > www.tivo.com.au	**Panasonic DMR-BW500** The ultimate high-definition DVR — can record two HD programs simultaneously to its 500GB hard disk or directly to Blu-ray media. A bucketload of connectors too. $2,199 > Panasonic > Panasonic.com.au
ROUTER	**D-Link DGL-4500** A dual-band gigabit router built for gamers. Helps prioritise game traffic, and now with Green technology, which detects link status and cable length and adjusts power usage accordingly. $350 > D-Link > www.dlink.com.au	**TP-Link TL WR941ND Wireless N** A Draft 2.0 N router with MIMO, using three adjustable antennas for speeds of up to 200Mbit/s. Performance is decent and the documentation is good. $129 > TP-Link > www.anyware.com.au	**Linksys Dual-N WRT610N** It does dual-band Wireless N (5GHz and 2.4GHz), is one of the best performers in testing and looks great. Comes with Linksys' superb LELA network setup wizard. $290 > Linksys > linksys.com.au
PRINTER HOME	**Canon Selphy ES2** A dye sublimation printer, the Selphy can print directly from every variation of memory card and even from mobile phones, and you don't need a computer. $299 > Canon > www.canon.com.au	**HP Color LaserJet CP1215** It's not the fastest colour laser out there, but it has two things going for it: the HP LaserJet heritage and its price, which is well-affordable home use. $299 > HP > hp.com.au	**Samsung CLP-350N laser** The first in the Samsung lineup of excellent affordable colour lasers, with all the specs to meet basic home or business requirements. $399 > Samsung > Samsung.com.au
PRINTER — SMB	**OKI B430dn** If you're looking for a solid workhorse mono laser, OKI's B430dn is perfect for the task, and should keep many small businesses happy. $875 > Oki > www.oki.com.au	**Dell 2130cn** Dell is becoming synonymous with value in business printers. Its 2130cn is a good entry-level, biz-grade colour laser, with a duty cycle of 40,000 pages/mth. $499 > Dell > dell.com.au	**HP Color LaserJet CP3525x** On the expensive side, but the CP3525x provides Gigabit Ethernet in addition to USB 2.0. Great if you feel the need for speed and can put up with some noise. $2,403 > HP > www.hp.com.au
MFC	**Canon MX860** Canon's MX860 is a full-function inkjet MFC aimed at the lower end of the SMB market, with USB 2.0, 802.11b/g and 10/100 Ethernet. $299 > Canon > www.canon.com.au	**Epson Stylus Photo TX800FW** This stylish MFC will look great in a home office — but it also produces good photos and good copying results. Can also be shared across a network. $399 > Epson > www.epson.com.au	**Brother MFC-6490CW** If your business needs an A3 printer, the Brother MFC-6490CW is a good choice. Includes both Wi-Fi and Ethernet interfaces. $549 > Brother > www.brother.com.au

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FROM THE READERS OF APC

APC MAGAZINE OWNER BUILDER READER PC

masterbuilder@acpmagazines.com.au

Submit your PC configuration to *APC*'s Master Builder and, if chosen to appear in the mag, you will win a G35 Surround Sound Headset. Worth $199.95, it's ultimate gamers' headset, providing game-changing immersion with 7.1 surround sound powered by Dolby technology. Victory never sounded so good. Send your PC configuration to masterbuilder@acpmagazines.com.au in exactly the same format as published on this page.

All-rounder for games and more

Another young APC reader shows off his all-round PC beast.

CORE SYSTEM

SYSTEM COST $2,090

Barton Ip is only 13 but his enthusiasm for PC building knows no bounds. He says his PC's configuration is great because it didn't cost him a lot and provides decent performance. "Games like Crysis and Left 4 Dead play well on it. I'm going to upgrade to an ATI HD 4870 later this year, and maybe a 16GB SSD to run the operating system."

CPU
Core 2 Quad Q9550 — $370
I chose this because the 45nm technology gave me headroom for overclocking, and with an aftermarket cooler you can't go wrong.

COOLER
Cooler Master V10 — $190
I bought this cooler with money I got for my birthday. This is one of *the* best coolers imaginable. Three words: Thermal Electric Cooling. Even though it had a hefty price tag, it was the best $190 ever spent. I could've got another graphics card, but the V10 eliminates the need for noisy fans. This lets me play Crysis for hours on end without ASUS PC Probe screaming at me.

RAM
4GB Corsair DDR2-800 — $90
Nice and cheap RAM that can be modified with good timings. They keep my RAM cool.

MOTHERBOARD
ASUS P5Q Deluxe — $280
This was my first choice, as I'm a die-hard ASUS fan. It was one of the most powerful boards for under $300: ExpressGate, a range of RAID options... what's not to love?

GRAPHICS
HIS-HD4870-E5-V — $380
This is a great DX10 card. Running on XP and using third-party software for DX10 gives it extra punch.

HARD DISK DRIVE
1TB Samsung, 2 x 250GB Seagate — $230
RAID 0 gives me better performance on my OS. Setting the PageFile on the 1TB drive is also a smart thing to do. Your OS's disk is always free and ready to run your programs.

DVD BURNER
ASUS BC-1205PT Blu-ray combo drive — $250
This lets me watch my Blu-ray movies at Full HD without buying a player. My monitor shows colour better than my TV anyway.

PSU
Cooler Master eXtreme Power 650W — $110
Gives the PC enough juice to run smoothly. The big 120mm fan cools it down. It collects a ton of dust over a couple of months.

CHASSIS
Antec Nine-Hundred — $190
This case is phenomenal. Can cool everything really well, with an extra 120mm fan to cool your graphics card. Keeps your machine silent by keeping the noisy graphics card fan on low.

EXTRAS

MONITOR
BenQ T2200HD Full HD monitor — $260
One of the best things about the T2200HD is that the colour that comes out of it is completely beautiful. It changes your game experience because the refresh rate gives you a better feel to it.

AUDIO
On-board hi-def sound card / Logitech X-530 speakers — $90
The hi-def sound card and surround sound speakers give me awesome sound on games. Watching Blu-ray is even better. The sound is surreal. The bass on the X-530 is adrenalin-pumping. Techno never sounded better.

KEYBOARD & MOUSE
Generic — $20

APC reader and Owner Builder, Barton Ip.

masterbuilder

HOW TO BUILD THE ULTIMATE PC

APC MAGAZINE MASTER BUILDER PRO BUILD

One of the joys of computing is building your own PC. Each month a Master Builder will configure a PC for a specific task and pricepoint, recommending the best components for the job. But we also want to know what you, our readers, are building, so Owner Builder is your showcase.

Dial AMD triple-core for affordable performance

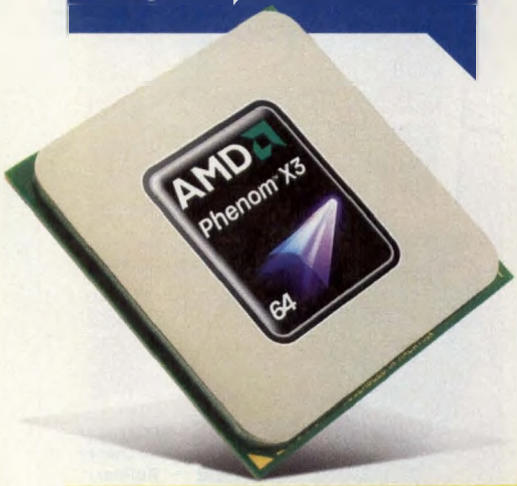
Excel Computers' Master Builders use AMD's new triple-core CPU to create an amazing value/performance PC.

AMD's new triple-core Phenom II X3 CPU is actually a quad-core CPU with one core disabled, which makes it about half the cost of normal quad-core CPUs but with performance equal to that of a full quad-core chip for single-threaded applications.

We asked Excel Computers to create a value/performance PC based around this CPU. Excel Computers is a Sydney-based system builder who win awards regularly for extracting performance from value-priced PCs.

CORE SYSTEM

SYSTEM COST $1,107



CPU

AMD Phenom II x 3 triple core processor — $205

[2.8GHz; wattage 95W; 6MB cache; Socket AM3]

It's the disabled core that makes the Phenom II X3 highly affordable, but there's still three other cores that deliver fantastic performance, not just in single-threaded apps, but also in multi-threaded apps, such as high-def video editing. It easily handles digital entertainment workloads.

COOLER

On-board.

MOTHERBOARD

Gigabyte GA-MA780G-UD3H — $139

Combine the Phenom II X3 CPU with this Gigabyte board's AMD 780G chipset and you get processing and visual computing performance that users have historically received only in higher-end systems. Based on AMD's 780G chipset with an ATI Radeon HD 3200 graphics core, Gigabyte's 780G series motherboards are designed to boost the CPU to deliver great graphics performance.

RAM

Corsair T2X4096-64C5-6400C5 — $78

[2 x 2GB; DDR2 RAM; 240 pin DIMM; Non ECC Buffered; 5-5-5-18]

Corsair memory is more stable and offers a lifetime warranty. In addition, the heat spreader makes the memory stable with overclocking and high-end gaming.

GRAPHICS CARD

ATI HD 4770 — $175

[PCI-E 2.0 512MB GDDR5]

The HD 4770 is the best-performing budget card, with new 40nm technology that draws less power and runs cooler than its predecessors. ATI's Hybrid Graphics Technology can accelerate performance by harnessing the power of both the ATI discrete graphics card and the integrated graphics for outstanding performance and value.

HARD DRIVE

Samsung 1TB HD103UJ — $125

[7,200RPM; 32MB cache]

Its 1TB of storage is good for movies, music

Excel Computers' Master Builders, Sri Indrakanthan K (Senior Technician, left) and Jimmy Su (Systems Product Manager, right).

PRO OPINION

EXCEL COMPUTERS' JIMMY SU COMMENTS ON OWNER BUILDER BARTON IP' PC

SEE PAGE 69

I would like to start off by saying how impressed I am of Barton's PC building knowledge at only age 13! The system overall is very well configured for heavy duty gaming but some extra performance can be squeezed out of it for a fractional increase in price. Switching to the newer socket 1366 platform with an Intel 920 i7 CPU and an ASUS P6T-SE Motherboard gives the machine a bit more power for only about a $100 difference. Current RAM prices are also a good excuse to upgrade; 3GB of DDR1333 is only $30 more than 4GB DDR800 opening up a lot more options if you are into overclocking. The excellent use of Cooler Master's V10 and its TEC cooler would make up for the extra bit of power from the i7 and should safely support clock speeds up to 3.6GHz. Furthermore the 1366 platform allows future upgrades as Intel moves away from its C2Q processors.

and games. Faster data transfer with SATA interface. Improved recording stability, and environmentally friendly with RoHS (Restriction of Hazardous Substances Directive) and Noise Guard feature.

OPTICAL DRIVE

LG GGC-H20 Blu-ray combo burner — $182

LG is one of the top brands. With the Blu-ray combo drive you can get the full HD 1080 experience, thanks to Blu-ray support from the AMD 780G chipset and the AMD Phenom II X3 processor.

WIRELESS CARD

D-Link DWA-G510 — $33

D-Link is a leading maker of networking products, and this wireless card provides security and connectivity that's compatible with all wireless standards.

CASE

Antec Two Hundred — $85

Very good gaming case with a 10-drive bay. Makes it easy to install an ATX motherboard.

POWER SUPPLY

Silverstone 500W ST50F-230W — $85

This very stable and durable power supply comes with a 120mm fan, 2 x Triple SATA connectors, 2 x 6-pin PCI-E connectors and half modular cable.

EXTRAS

KEYBOARD & MOUSE

Logitech Cordless Desktop EX 110 — $67

This keyboard is a very reliable wireless one, with one-touch controls, programmable F keys and spill-resistant design. The mouse comes with a quick-response optical and scroll wheel.

MONITOR

BenQ E2412 HD 23.6in Widescreen LCD — $315

A perfect full HD 16:9 display with a 40,000:1 dynamic contrast ratio and 1,920 x 1,080 resolution. Comes with HDMI 1.31/D-SUB/DVI-D connections.

Total cost with extras: $1,489

Best builds

Advanced system builder and overclocker Josh Collins recommends the best components for three PC builds.

JOSH COLLINS
Josh is one of the world's foremost overclockers. His expertise is often sought by component makers.

	BUDGET $1,000	MID-RANGE $3,146	OVERCLOCKER'S PICK $2,699
CPU	Intel Pentium E5200 2.5 GHz Ultra-cheap entry-level CPU which can be overclocked to perform like a more expensive CPU, such as an E7300. Intel > www.intel.com $100	Intel Core i7 920 The baby of the Intel Core i7 family blows away its predecessors with its multi-processing. Requires an X58-based motherboard. Intel > www.intel.com $400	Intel Core i7 920 A fun processor to overclock, is not only relatively easy to get to 4GHz, but it can create some devastating results on benchmarks. Intel > www.intel.com $400
COOLER	Intel stock cooler NEW A third-party cooler isn't a necessity at this level and allows for this system to hit the $1,000 price point. Intel > www.intel.com $0	Noctua NH-U12P NEW Offers performance and maintains a stealthy operation. If you find the LGA775 version, Noctua will ship you a LGA1366 conversion kit. Noctua > www.noctua.com.at $90	Noctua NH-U12P NEW An extremely capable heatsink. Is great for finding high air overclocks while maintaining some form of decibel discreteness. Noctua > www.noctua.com.at $90
MOBO	GIGABYTE GA-EP45-UD3L - $150 NEW Ultra-Durable 3 and Dynamic Energy Saving (DES) technologies paired with good performance and it can handle some overclocking. Gigabyte > www.gigabyte.com.au $150	Gigabyte GA-EX58-UD3R MB Stable and reliable under both stock and overclocked conditions; also supports both NVIDIA SLI and ATI CrossFireX technologies. Gigabyte > gigabyte.com.au $270	ASUS Rampage II Extreme NEW This beast is built to overclock. It has SupremeFX X-Fi audio and support for NVIDIA SLI and ATI CrossFireX. ASUS > www.asus.com.au $679
RAM	Corsair CM2X2048-6400C5 NEW DDR-800 performance with CAS5-based latencies. Provides sufficient memory for basic computer usage and there's room for an upgrade. Corsair > www.corsair.com $40	Patriot PVT36G1600LLK 6GB NEW Growing ever stronger in the Australian market, Patriot now provides a well-performing 6GB triple-channel kit to the masses. Patriot > www.patriotmemory.com $200	Corsair Dominator GT NEW While not the fastest kit within Corsair's Dominator GT line, it's based on the same wickedly fast ICs as used on DDR3-2000 modules. Corsair > www.corsair.com $425
GRAPHICS	Sapphire HD 4770 The first affordable card to use GDDR5 memory, and with a 40nm core. It'll run most games on a 22in screen in nearly full resolution. Sapphire > www.sapphiretech.com $170	Sapphire HD 4890 1GB GDDR5 NEW Made using the highest binned chips from the HD4890 series, overclocked from the factory and CrossFireX-ready. Sapphire > www.sapphiretech.com $380	ATI Radeon HD 4890 NEW The brand doesn't matter, unless of course you want to have a pre-overclocked base frequency to start from — but where's the fun in that? AMD > www.amd.com $280-$340

	BUDGET	MID-RANGE	OVERCLOCKER'S PICK
HDD1	WD Caviar Green 500GB (NEW) An extremely affordable option, offering 500GB of space at a mere 15 cents per gigabyte. Western Digital > www.westerndigital.com $75	2 x Western Digital Caviar Black 1TB Setup in either RAID 1 or RAID 0, these two RAID-ready disks can provide HDD-based performance or a solid backup solution. Western Digital > www.westerndigital.com $400	WD Caviar Green 500GB (NEW) Hard drives don't play too big a role in overclocking. Unless taking on benchmarks such as PCMark, any old drive will do the job. Western Digital > www.westerndigital.com $75
HDD2	None needed (At this price point, there's no budget for a second drive.) N/A	WD VelociRaptor 300GB Fastest mechanical drive, with 300GB space. Should be the primary drive for OS and apps, while a fat, slower drive holds the data. Western Digital > www.westerndigital.com $320	None needed Not necessary when overclocking, unless the primary drive is not separated into two partitions. N/A
OPTICAL	Pioneer DVR218L (NEW) With optical drives having gone up in price recently, the Pioneer DVR218L provides solid performance and at a decent price. Pioneer > www.pioneer.com.au $55	LG Blu-ray/HD-DVD Combo Drive Plays both Blu-ray and remaining HD-DVD discs, and also comes with PowerDVD 7. Can be upgraded to support 6-channel audio. LG > www.lg.com.au $206	Pioneer DVR218L (NEW) It doesn't have to be a DVD optical drive, but it helps when making slipstreamed installations with drivers and apps pre-installed. Pioneer > www.pioneer.com.au $55
PSU	OCZ StealthXStream 500W SLI (NEW) Though certified for SLI, this will also do the trick should you choose to throw in a second HD 4770 later on for a CrossFire configuration. OCZ Technology > www.ocztechnology.com $95	Corsair TX750 (NEW) An excellent-quality power supply with a massive 60A single rail, it's capable of fulfilling any reasonable power requirements. Corsair > www.corsair.com $220	Corsair TX750 (NEW) This 60A single-rail beasty should do the job for most OCs. If you're going to run a huge SLI or CrossFire configuration, consider two. Corsair > www.corsair.com $220
CASE	Cooler Master Elite 331 (NEW) A winner with many budget system builders, the Cooler Master Elite 331 offers a good looking chassis and decent build quality. Cooler Master > www.coolermaster.com $60	Lian-Li PC-60FW Black Simple and stylish case with all the room needed for a mid-range system. Made of aluminium with the classic Lian-Li build quality. Lian Li > www.lian-li.com $200	HSPC Tech Station (NEW) The perfect case for the keen hardware enthusiast and PC overclocker. Also check out the newer 'Top Deck' version. HSPC > www.highspeedpc.com $120
MONITOR	BenQ E2200HD A 21.5in Full HD widescreen LCD monitor offering 5ms response times, 1,920 x 1,080 resolution and dynamic contrast ration of 10,000:1. BenQ > www.benq.com.au $235	BenQ G2412HD (NEW) 24in widescreen LCD that's capable of full high definition, with all the necessities and under $300. Enough said. BenQ > www.benq.com.au $280	BenQ E2200HD (NEW) Supporting Full HD resolution of 1,920 x 1,080, this offers value and will allow you to test your GPU using the X-preset in 3DMark Vantage. BenQ > www.benq.com.au $235
KEYBOARD	Logitech Ps II Keyboard and Mouse An affordable but effective combo. Combining packages of keyboard and mouse is the best way to stick to a budget. Logitech > www.logitech.com.au $20	Razer Lycosa Gaming Keyboard (NEW) A nice gaming keyboard with programmable macro keys and non-slip rubber finish: very stylish. Razer > www.razerzone.com $120	Logitech EX-110 combo (NEW) Cheap yet useful, this wireless keyboard-and-mouse combo will allow you to maximise your desktop space. Logitech > www.logitech.com.au $60
MOUSE	N/A Combinations of keyboard and mouse are the best options when trying to keep your peripheral costs down. (As above.) N/A	Razer Diamondback 3G (NEW) Featuring a 1,800dpi infra-red sensor, seven programmable buttons and on-the-fly sensitivity adjustment. Great for gamers. Razer > www.razerzone.com $60	Logitech EX-110 combo (NEW) Relatively cheap and useful when there isn't quite enough bench space for the keyboard and mouse to be taking up bench area. Logitech > www.logitech.com.au AS ABOVE

TRANSFORMERS

NEW TECH THAT CAN RESHAPE YOUR PC!

Upgrading components can revitalise an ageing rig, but too few of us know where to start. **Alan Dexter** lends a hand.

According to Microsoft, less than five per cent of end users of its operating systems open up their machines. Given that upgrading is one of the cornerstones of what has traditionally made the PC such an attractive platform, that's an amazing statistic. Why aren't more of us extending the life of our machines with a simple upgrade? Has our throwaway society really reached the point where it's easier to replace the whole machine rather than keep it up to date by upgrading? Perhaps people worry that their warranties will be invalidated, or think that swapping components around is more hassle than it's worth. Is Microsoft making upgrading desktop computers tougher than it should be?

That five per cent statistic surfaced in defence to Microsoft's policy on having to reactivate Windows when you change a significant number of components in your machine. Adding more memory or replacing the graphics card shouldn't incur the wrath of Redmond. But touch the motherboard or the main hard drive, and you'll probably need to reach for the phone.

Reactivating Windows is little more than an annoyance, though, so it's hardly a deterrent. Is the real reason simply that upgrading has become too complex and expensive? Over the coming pages we'll look at the many different options available, what tricks you need to bear in mind when physically upgrading and what you need to look for when considering a prospective upgrade. We'll also look at the performance advantages of some of the key components and the trends and big releases that will change the upgrading landscape in the coming months. Upgrading your machine isn't a dark art. So while delving into the depths of your PC case might sound scary, don't be frightened. Let us take you by the hand and ease you into getting started on making some essential upgrades to your system.

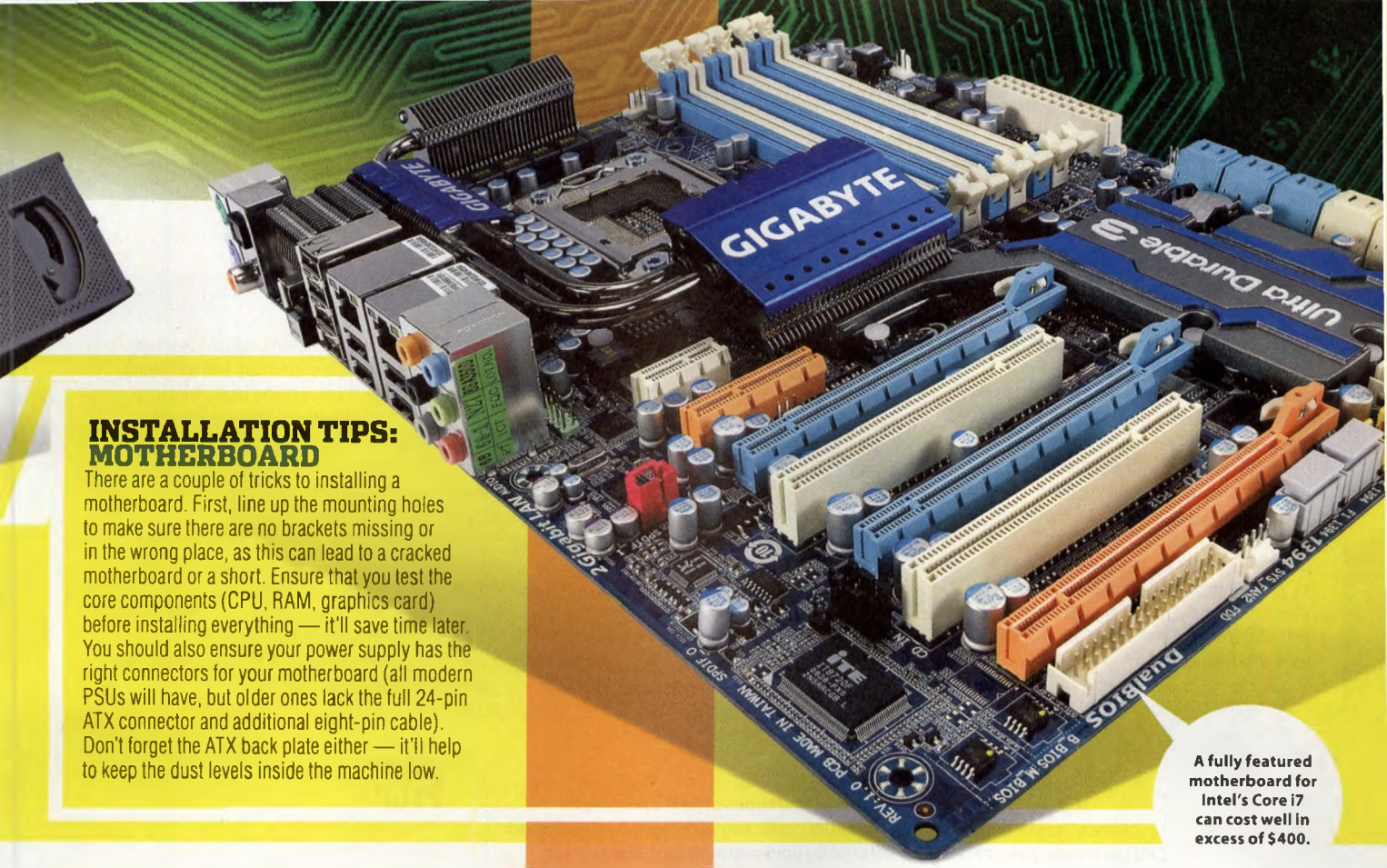
MOTHERBOARDS

Picking a motherboard isn't like picking any other component in your machine — it's less of a component and more of an assertion of a choice of platform. How you pick a motherboard is more about everything else that's going to end up in your machine rather than which features you would like on it. Your choice of motherboard can essentially be reduced to asking which of the two CPU manufacturers you want to patronise, as Intel and AMD haven't shared a common platform since the days of the 486. So only once you've picked your processor can you decide which motherboard you want to use in your system.

The latest platforms from Intel and AMD represent a fundamental change in the role of the motherboard. Both Intel's Core i7 and all of AMD's Athlon/Phenom/ Phenom II CPUs now feature integrated memory controllers. At the most basic level, this means that the raw performance that used to separate the various motherboard chipsets has vanished. Nowadays, apart from additional logic and a better selection of voltage regulators and capacitors to assist overclocking the chips, there's little to separate motherboards in terms of data throughput.

If you're looking to differentiate motherboards by way of features, you're going to need a magnifying glass, as the most essential features are now included across the board. This isn't due to a malaise among the motherboard manufacturers, but rather a shift to where the features are integrated. Indeed, it isn't the motherboard manufacturers that offer up the core competencies these days — it's the chipset manufacturers. For instance, you no longer need to go out of your way in order to find a motherboard offering RAID support, because RAID 0/1/5 is now standard on all modern chipsets.

There aren't as many companies manufacturing motherboard chipsets at the moment either — NVIDIA and AMD produce chipsets for AMD's CPUs, and Intel covers its own bases. Intel's Core i7, for instance, is currently only served by one motherboard chipset: Intel's own X58. Motherboard manufacturers have managed to tweak this situation to address a number of price points, but these are still generally expensive. The feature-sets are impressive, but the lack of a truly affordable motherboard has undoubtedly held the Core i7 back. Gigabyte managed the low price on the GA-EX58-UD3R by shaving off two memory slots, which capped the maximum memory offered by the motherboard — although realistically, four slots should be



A fully featured motherboard for Intel's Core i7 can cost well in excess of $400.

INSTALLATION TIPS: MOTHERBOARD

There are a couple of tricks to installing a motherboard. First, line up the mounting holes to make sure there are no brackets missing or in the wrong place, as this can lead to a cracked motherboard or a short. Ensure that you test the core components (CPU, RAM, graphics card) before installing everything — it'll save time later. You should also ensure your power supply has the right connectors for your motherboard (all modern PSUs will have, but older ones lack the full 24-pin ATX connector and additional eight-pin cable). Don't forget the ATX back plate either — it'll help to keep the dust levels inside the machine low.

sufficient for the vast majority of users.

There are still a few differentiating features between motherboards, though, with audio support being a major selling point for most manufacturers. How many Gigabit Ethernet ports are included can also separate one board from the next, while those looking to attach FireWire peripherals will find themselves having to pay out a little more to find a motherboard that supports the technology. Indeed, for many it may be worth buying a more affordable motherboard and a FireWire PCI card instead of one that offers support natively.

A selection of premium motherboards fall under the 'enthusiast' banner, with those featuring overclocking options costing more than normal boards. A card with a back-up BIOS will set you back more, for instance, but it can save you time if you push an overclock too far. Onboard power and reset switches can also be useful if you like to tinker inside your machine, although again these tend to be available only on the higher-end boards.

If you're planning on running multiple graphics cards, one of the most impressive solutions currently available is Intel's X58 chipset. This is the first time that a single motherboard chipset has been able to support both ATI's CrossFire and NVIDIA's SLI technologies. We'll cover this in more detail when looking at graphics card upgrades, but for those who like the idea of multi-GPU graphics but don't have a particular allegiance, it certainly makes Core i7 a tempting platform.

FACT FILE

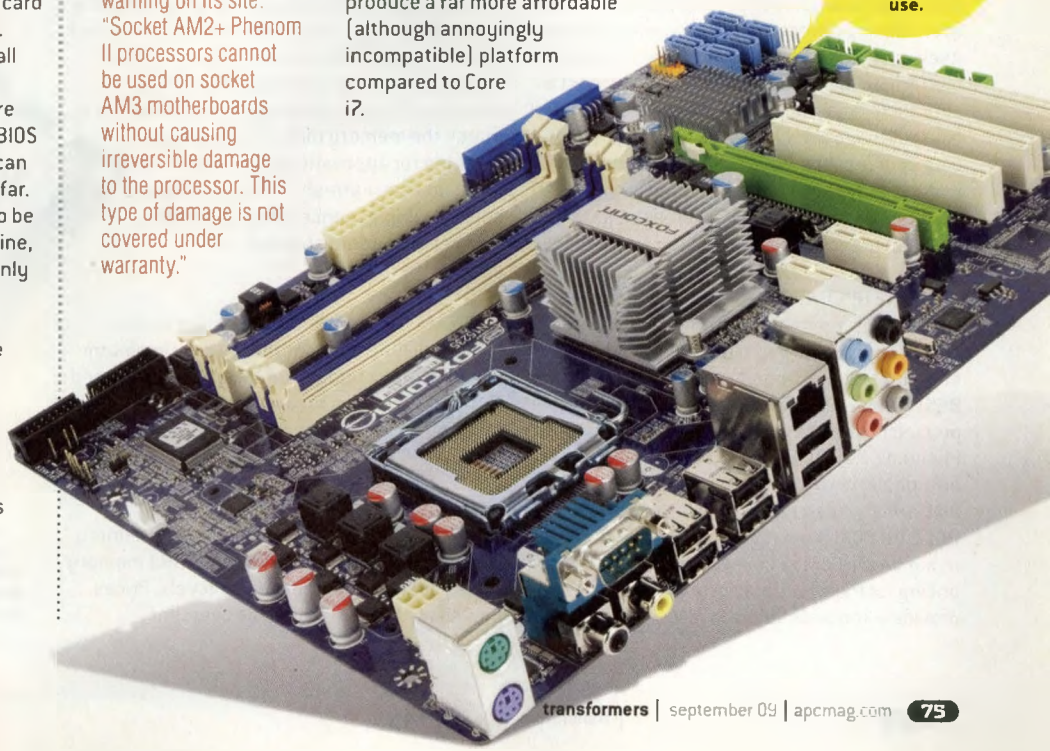
Although AMD's AM3 Phenom II processors are backward-compatible with AM2+ motherboards, the opposite isn't true. AMD currently has a warning on its site: "Socket AM2+ Phenom II processors cannot be used on socket AM3 motherboards without causing irreversible damage to the processor. This type of damage is not covered under warranty."

ULTIMATE UPGRADE: If you're looking to get the full gamut of features, the Gigabyte GA-EX58-Extreme ticks all the right boxes, including FireWire support, HD Audio and up to 24GB of DDR3 RAM.

BEST BANG FOR BUCK: AMD's Phenom II processors may support DDR3 memory, but the difference over DDR2 is slight, making the likes of the ASUS M4A78 a wise buy for those on a budget.

HOLD ON FOR: The release of Core i5 should produce a far more affordable (although annoyingly incompatible) platform compared to Core i7.

Don't spend more than you need to — pick a motherboard that has features that you'll actually use.



INSTALLATION TIPS: CPU (INTEL)

The core technology may be spot on for Core i7, but Intel still has a few idiosyncrasies to iron out from a building perspective, not least of which is the retention mechanism for its coolers. Try not to sweat too much if the motherboard bends as you push each retention pin into place — that's to be expected. Be careful as you slot the CPU into place, though; if you're too rough, you'll damage the sprung pins of the socket and find yourself looking for a new motherboard.

CPU (AMD)

AMD has changed tack in response to the release of Core i7, and instead of trying to match the blue giant in a straight performance race, it has instead focused on the affordability of its processors and the overall cost of the platform it runs on.

As far as straight upgrades are concerned, it's much easier and significantly more affordable to upgrade to the latest Phenom or Phenom II than it is to throw everything out to get a Core i7 CPU.

A big reason for this affordability is the fact that AMD has kept upgrade paths in mind as it developed new technologies: its latest Phenom II chips, for instance, are pin-compatible with existing AM2+ motherboards, which also happen to be inexpensive. This, coupled with garnering great throughput from existing DDR2 memory, has meant that AMD offers great performance for the cash. You do need to match the type of processor you buy with your motherboard though — AM2+ CPUs can't be used with AM3 motherboards.

There are no major tweaks to perform when installing a new processor; just take care when physically installing it. It should be eased gently into the slot and the retention arm closed firmly. Your motherboard BIOS may need flashing if you're upgrading, though, which is worth doing before you install the new chip.

CPU (INTEL)

The launch of Intel's Core i7 has changed the CPU landscape considerably. Intel already had a lead on its old rival AMD thanks to the raw power of the Core 2 Duo. While these chips were somewhat inelegant, they delivered where it counted most: raw performance. Core i7, however, has opened a gulf between the two companies and, thanks to the inclusion of a memory controller, meant that AMD's often-lauded memory throughput has finally been eclipsed. Intel has recently released new revisions of the Core i7, and the Core i7 920 has quickly become the most sought-after processor around, thanks in no small part to its overclocking potential. However, while the chip itself isn't too expensive, you'll need the whole platform to make use of it, and that can cost a surprising amount of money when it's all added up. You'll need a socket 1366 motherboard to plug your processor into, enough memory to make sure the new processor has room to breathe (6GB has quickly become the norm) and of course the processor itself.

ULTIMATE UPGRADE: The eight logical cores of the Core i7 represent the pinnacle of desktop computing. The new 920 D0 stepping offers stunning value for money, too.
BEST BANG FOR THE BUCK: Multicore processors needn't cost the earth. The AMD Phenom II X3 720 Black Edition isn't just affordable, it's also the basis of an affordable platform that can still deliver big numbers.
HOLD ON FOR: It's not going to trouble the Core i7, but Intel's Core i5 boasts a more mainstream pricing for the whole platform that could provide a knock-out blow to AMD.

RAM

There are four types of RAM currently in circulation, and they're defined by the support offered by your motherboard. The newest addition to the world of memory is DDR3, and it's an integral part of Intel's Core i7 and AMD's AM3 platforms. However, older DDR2 RAM is still the most common memory standard (Core 2 Duo and Phenom both use it), and for good reason: it's affordable, well supported and has a proven track record. The third most popular type of memory is DDR, which could be the memory in your machine if you haven't upgraded in recent years. If you've got a very old machine then you may still have basic SDRAM, in which case you'll find upgrading surprisingly expensive, as it's now very much a niche technology. Whichever memory standard you're using, RAM sticks are defined by their speed and latency. There are a few things to watch out for: you need to get the new sticks to match the memory that's already in your machine (or alternatively throw that away and start afresh), and you need to buy in multiple numbers that match the number of memory channels on your motherboard.

ULTIMATE UPGRADE: You can get far more affordable 6GB kits, but the Corsair Dominator GT set boasts support for 2GHz bus speeds and 8-8-8-24 latencies for an impressive slice of memory performance.
BEST BANG FOR THE BUCK: The OCZ Gold 6GB 10666 triple-channel kit makes for the perfect accompaniment to a Core i7.
HOLD ON FOR: There are no major new memory technologies on the horizon, and DDR3 memory prices are finally at reasonable levels. Prices should continue to fall a little over time.

FACT FILE

The Serial Presence Detect (SPD) on a memory stick holds timing information for that memory stick at its supported frequencies. However, these settings are constrained by the JEDEC specifications, so even if the memory is capable of running faster, that information can't be stored on the SPD.

You can spend a fortune on RAM, but there are great budget kits such as the OCZ Gold series available too.

The bigger your screen, the more expensive a graphics card you'll need — for gaming at least.

INSTALLATION TIPS: GRAPHICS CARDS

There are two things to bear in mind when installing graphics cards. The first is that you mustn't forget the power connectors on the card, otherwise your ears will be assaulted by a very loud warning beep. The other is to remember that your drivers will be out of date the moment that you buy the card. You should always install the drivers from the GPU manufacturer's web site. We'd recommend sticking with the WHQL drivers.

GRAPHICS CARDS

The graphics card is the most likely of all modern PC components to start a heated debate. Why? Because anybody who has bought one of the latest and most likely expensive pixel-pushers will be keen to justify their purchase. However, when all the passions have been spent and the dust has settled, there is little separating the latest offerings from AMD and NVIDIA. As ever, though, the devil is in the detail.

A fundamental shift has taken place between AMD and NVIDIA's graphics cards recently, and it's to do with how the companies are approaching the highest end of the 3D market. NVIDIA has largely maintained the stance that it can keep improving and tweaking its cores to produce faster and faster GPUs, and to some extent it has succeeded. AMD, on the other hand, has concluded that multiple GPUs are the answer for high-end products, and so it has been focusing more on the mainstream market, with high-end solutions made up of combinations of the mainstream chips. And again, the company has been successful to a degree. What this means to us as upgraders is that there is a wide range of graphics cards available that can transform your gaming experience. Specifically because of the refocusing, an incredible amount of GPU power can be had at the more mainstream end of the scale, with cards now more than capable of driving a 20in or 22in screen at the native resolution with all the effects turned on.

You'll need a bigger screen in order to get the most from the more expensive cards, with the likes of the GeForce GTX 275 capable of running a 24in screen at the highest settings at a smooth 60fps. Indeed, it's only when you connect a machine to a 30in screen that you really push the current generation of cores, and it's then that you either have to select a single-card multi-GPU solution or go for an SLI or CrossFire card to drive the screen properly. At this point you can easily spend a small fortune on a graphics subsystem but with good reason: the end results are extremely impressive.

An alternative way of using SLI and CrossFire is as an upgrade path in itself. Buy a card now, and then buy a second card later for a moderate performance boost. It's not a bad theory, but in practice finding a card a couple of years out of date is tricky, and stockists tend to charge roughly the same for older cards as they do for a more modern card. The second-hand market can help you track down that second card, but there will be no reassurances that the card will work, so it can be risky. You're looking at roughly a 60 to 70 per cent performance improvement from the addition of that second card, so it may not transform your gaming the way that you were looking for anyway. And while driver support for such solutions has improved, it's still not perfect. Essentially, we'd recommend caution when it comes to both SLI and CrossFire graphics cards, unless the card in question is so affordable that it becomes a risk worth taking.

One thing you do need to be aware of when eyeing up a potential graphics card is that you'll not only need enough power to run the card, you'll also need the connectors to do so. The more mainstream cards require just a single six-pin connector, but faster cards will require either a pair of these, or one six- and one eight-pin. You need to make sure that there's ample cooling in your machine too, as some cards (particularly dual-GPU solutions) can reach close to 100°C under full load.

Once you've decided on price and selected the GPU you want driving your graphics card, things come down to the clockspeed of the GPU and RAM and the amount of RAM on each card.

ULTIMATE UPGRADE: If you're looking to drive a large screen, the ASUS GTX 295 is an incredible piece of graphics kit. Capable of running all modern games smoothly, it's a stunning one-stop card.

BEST BANG FOR THE BUCK: It's a close battle between AMD and NVIDIA for best value, but the recent price battle makes the Sapphire HD 4870 1GB the best choice.

HOLD ON FOR: Things should hot up once Intel enters the market with its card-on-a-CPU Larabee, and assuming that it's any good, we should see the price battle intensify even further. On paper it looks very interesting, so if you fancy giving it a try, hold your horses on the graphics card front for a bit.

INSTALLATION TIPS: RAM

Hold the memory DIMMs at the edges so as not to damage the chips. Firmly ease the chips into the slots so that the clips click into place at both sides. Check your motherboard manual to make sure that you populate the right slots to enable multiple-channel access. Check the POST screen to make sure that this is configured correctly. You may need to reset your BIOS settings (clear the CMOS) when you add new memory, too.

HARD DISKS

Hard drives have maintained that unerring pace of progress that only computer components seem to achieve: the core technologies behind them are continuing to improve (leading to larger capacities and faster throughput), while the price tags just keep on dropping. As a snapshot of the current state of the hard drive market, you can pick up a 1TB hard drive for as little as $125. The technological advances mean that such drives perform well too, with some managing read speeds as high as 80MB/s.

If you want serious performance, though, there is a slightly more newsworthy addition to the storage market in the form of 'affordable' solid state drives (SSDs). This technology has been rumbling along for years now, but the launch of the Intel X-25 pushed SSDs out from their niche to become a serious consideration for anyone looking for high-performance components. High-end SSDs offer read speeds of over 220MB/s and much improved write performance. Even if you can't afford a top-of-the-range SSD, a low-end drive will generally give twice the performance of conventional platter-based drives.

Ideally you want to set the SSD up as your main boot device, as it can as much as halve your boot time. There are two significant downsides to SSDs, though: their capacities are tiny when compared to platter-based drives, so you'll need one of those for your data anyway, and they're significantly more expensive than standard hard drives. If you can afford it, the best solution is to use an SSD as a boot drive and a conventional platter-based drive for your data.

INSTALLATION TIPS: HARD DISKS

It's not difficult to add additional drives. You'll need to make sure that there are spare SATA connectors on your motherboard and that you haven't used up all of your PSU's Molex connectors, but other than that it's easy. Plug it in, boot your machine and you're done. If you're looking to replace your boot drive, however, copying the data across can be tricky. You can copy the partitions across using the Diskpart utility from the Windows installation disc, but it isn't easy. Luckily, the likes of Norton Ghost can ease the process considerably.

Hard drive technology continues to improve, but SSDs offer a high-performance alternative.

ULTIMATE UPGRADE: It's not cheap and it's not particularly big, but it's incredibly fast: Intel's X25-E has made SSDs a real consideration for those looking for performance. It may hold only 32GB, but the X25-E will leave your existing hard drive looking pathetically slow.

BEST BANG FOR THE BUCK: The perfect accompaniment to an SSD or indeed as a main drive for the more cost-conscious upgrader, the Hitachi Deskstar boasts a 16MB cache, 7,200rpm spindle speed and a cool 1TB of storage for a paltry sum.

HOLD ON FOR: The SSD market is still growing, but expect prices to settle a little over the coming year, thanks in part to improved support from Windows 7. Hybrid drives may offer the best of both worlds, so keep an eye out for them.

FACT FILE

The 80 PLUS initiative is promoting more efficient power supplies. The PSUs are rated at 20, 50 and 100 per cent loads, and their efficiencies checked. There are then three additional levels of certification — Bronze, Silver and Gold — with power supplies required to be over 80 per cent efficient at 20, 50 and 100 per cent load.

You really get what you pay for when it comes to the chassis. Stick with a recognised name for the best build quality.

THE CHASSIS

Whether you credit the iMac or an endless stream of gaming PCs, the dour image of computers as beige boxes is behind us. Indeed, it's difficult to find such a case these days. Looks aren't the only criteria for picking a chassis, though, and apart from quality, materials and expandability, you'll also want to consider how easy it is to gain access to the machine's internals, how much effort it is to build in the first place and what front panel ports and connectors are on offer.

One golden rule of chassis buying is that you get what you pay for. If you're looking for a simple box to hold your machine, you don't have to pay over the odds. However, if you're something of a tinkerer then good build quality does make a difference, and a better finish on the panels and general construction will help ensure that the fans don't cause any rattles. If you're tempted to try overclocking, make sure that there are plenty of cooling options too.

If you're looking to build a machine from scratch, then a new chassis is an obvious addition to your shopping list. If your existing case is damaged or doesn't quite have enough space for all of your hard drives, shifting your entire machine from one chassis to another is something you should consider.

POWER SUPPLIES

While it would be reassuring to think that the massive success of netbooks means that low-powered computing is infiltrating every aspect of our computing lives, the truth is that performance computing continues to increase the demand placed on our power supplies. While we used to get by with the 250W PSUs that came bundled with PC cases, if you mean business then you're looking at making a separate purchase these days, and one that can set you back a tidy sum. It's not all bad news for the environment, though, as manufacturers are taking efficiency seriously — a lot of PSUs already offer 80 per cent efficiencies, but 85 per cent and 90 per cent models are on the way too. The hardest part about picking a power supply is working out how much power your machine needs. Thankfully there are free tools to help you work this out, ranging from the simple (**www.corsair.com/psufinder**) to the exhaustive (**www.extreme.outervision.com**).

ULTIMATE UPGRADE: It's undoubtedly overkill for the vast majority of machines, but at least with the CoolerMaster Real Power 1,250W PSU you know that you won't be caught short on the power front, even if you fill your machine with all the best kit.

BEST BANG FOR THE BUCK: If you don't fancy shelling out too much dosh, the OCZ StealthXStream 500W Silent should have you covered for an upgrade or two.

HOLD ON FOR: More efficient PSUs that can hit 90 per cent efficiency at high load are on their way, and while they may be more expensive to buy initially, they'll save you money over time.

ONE ESSENTIAL UPGRADE

Sometimes you just can't afford to upgrade your whole system. If you can afford one upgrade, and only one, then how you spend your money should be dependent on what you use your machine for. Gamers have it easy — a new graphics card is generally the way to go as long as the processor isn't more than a couple of generations old. If you move a lot of data around then a new hard drive makes sense. For heavy application use, the difference of having an SSD as the main drive is simply incredible.

However, for general day-to-day use, and for a more rounded upgrade for your money, we'd have to cheat a little and recommend that the move to the new Core i7 platform is the best upgrade you can make. Intel has done a sterling job of shattering many of the bottlenecks of previous generations: the memory throughput is stunning, and the raw power of Core i7 makes light work of traditionally intensive tasks. It's not without its downsides, of course — and in the case of Core i7 the downside is very much financial — but if you need the power, there's nothing quite like it. At least for now. It could easily turn out that the biggest threat to Core i7 is its soon-to-be-released sibling, Core i5.

Power supplies are defined more by their efficiency than raw power.

HD-DVD may have been the first casualty in the format war, but Blu-ray has hardly won; financially at least.

OPTICAL STORAGE

Apart from installing operating systems, our reliance on optical media has decreased significantly over the last few years. We simply don't burn DVDs as much as we did, instead preferring to carry files on USB drives or move them around on our networks. There are still times when you'll need to archive or install an application from a disc, though, so it's wise to have a DVD±RW drive in your machine. Happily, they're cheap enough these days. The base technology has plateaued, though, so don't look at optical drives as an upgrade. Instead, buy a new one merely as a replacement for a dead drive. Even SATA models don't offer anything particularly compelling, apart from the potential for slightly better internal airflow. Another option is Blu-ray, although with no guarantee that the format will be around in years to come (sales of Blu-ray discs have been slow), it's hardly a wise investment at the moment. We advise caution here.

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A couple of reasons to check out the APC web site

Tech news as it happens

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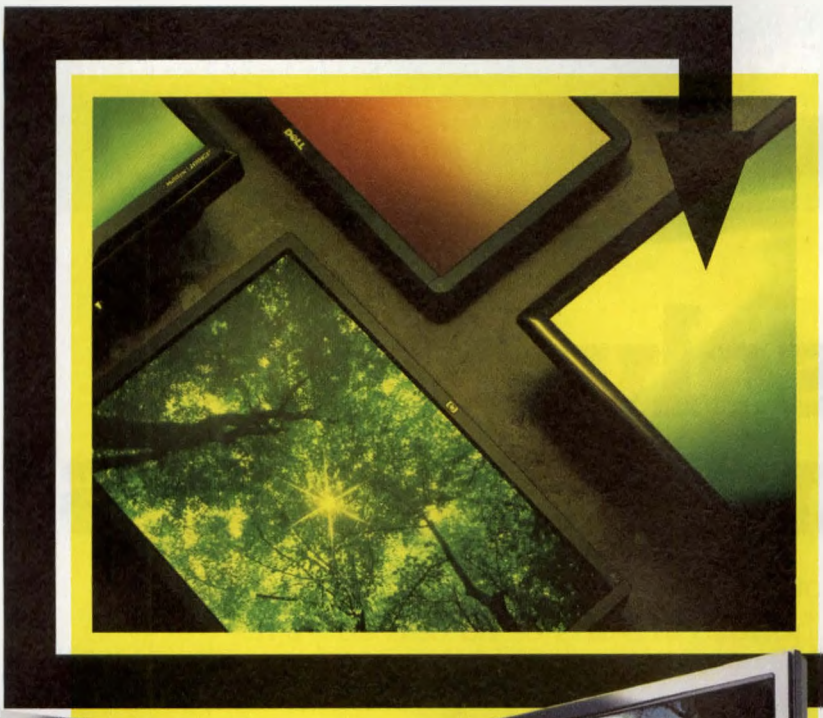
PROJECTS, TIPS AND TRICKS



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82 quicktips
HELP AND ADVICE

askapc@acpmagazines.com.au

In our Quick Tips area, we'll answer technical questions and provide quick tips to help you get more from your computer. If you have a question that other readers may be able to solve, email it to *APC* at askapc@acpmagazines.com.au, or post it online on our forums at **apcmag.com/forums** for a quick reply. We'll publish the best answers and tips each month in the magazine.

Experts solve your computing problems

APC, its readers and our partner publications can be one giant helpdesk. If you have a technical problem, chances are one of us can solve it.

SECURITY

PREVENT LAPTOP THEFT

Q I am often at conferences where it's impossible to tether the laptop to a desk. When I need to leave the room for toilet breaks or whatever, I am forever worrying that someone will steal it. What are the best security devices that can prevent theft of a laptop?

Peter Ross

A Short of getting a security cable and wrapping it around a meeting table's leg, the most elegant solution is a laptop motion sensor alarm. You can get a Targus DEFCON 1 Ultra Notebook Security Alarm, a small battery-powered device which attaches via a steel cable to your laptop's Universal Security Slot and sounds a 95db alarm siren if the laptop is moved or the cable severed. It retails for around $70. There is also a cheaper software alternative, Alarm, which sounds an alarm if the power cable to the laptop is disconnected. Purchase it online from UK company Syfer (**www.syfer.nl/**) for 3.99 Euros (around $6.50). It's compatible with XP and Vista.

INTERNET

TURN YOUR PC INTO A SIMPLE SERVER

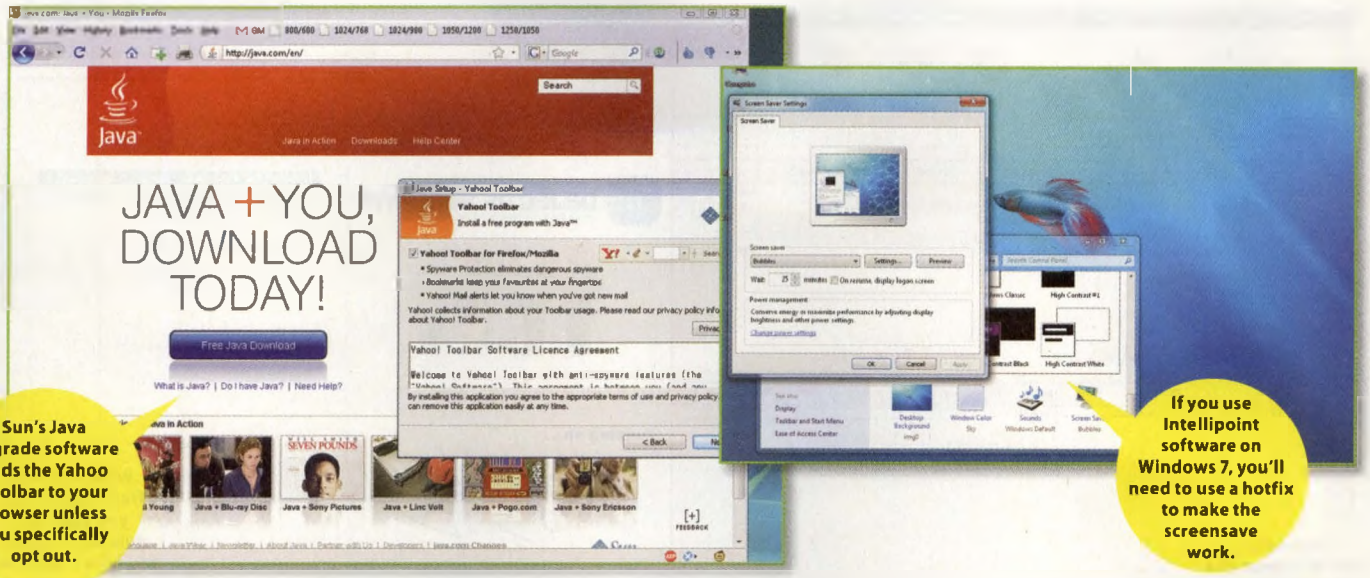
Q Is there a simple way of serving a web site from my own PC? I looked at setting up Windows Home Server, but I found I needed to configure stuff like domains, yada yada yada. It's overkill for sharing some simple sites with family and friends.

Tom Maynard

A There are couple of products that let you do this, but by far the simplest is actually the Opera browser and its Opera Unite services, which turn your PC into a simple server for everything from shared document and music files to web pages. Opera Unite was released recently with hyperbolic claims that it was going to revolutionise the internet, because it allowed people to serve content and share files without having to upload them to third party servers. Honestly, your nanna could set it up. Install the Opera browser and select the Unite services button, choose the Web Server option, register for a free Opera account, and give your computer a name. Then select the folder with the web files to make it the root of your site. And that's it. Opera provides you with a URL (**http://yourPCname**.

THE BEST TIP WINS THIS!

Whether you are a digital photography nut, into designing avatars or need a more intuitive way to mark up documents, the Bamboo Fun tablet from Wacom is for you. Plugged into PCs, Macs, or notebooks, the Bamboo Fun uses a pressure sensitive pen to navigate, draw, write, retouch, and paint. Adobe Photoshop Elements and Corel Painter Essentials come bundled for beginners, while confident users will find the Bamboo Fun unlocks the advanced pressure sensitive features in their favourite applications. RRP: $299 (Bamboo Fun Medium). Available from **www.wacom.com.au**


JAVA + YOU, DOWNLOAD TODAY!
Free Java Download
Yahoo! Toolbar
Yahoo! Toolbar Software Licence Agreement
Sun's Java upgrade software adds the Yahoo Toolbar to your browser unless you specifically opt out.
If you use Intellipoint software on Windows 7, you'll need to use a hotfix to make the screensave work.

yourusername.operaunite.com) that's resolved through Opera's proxy servers, and you share it with your site's prospective visitors. They can access your pages through any browser; it's only you that needs to install Opera and the Unite client.

However, bear in mind that you're limited to serving reasonably simple sites that use HTML/XML/CSS and simple JavaScript supported by the Opera Unite web server, although some users have already managed to make a Drupal-based site available. The point made on Opera's FAQ is "Opera Unite is not designed to replace professional Web servers, but to make it easy for people to share content without the technical knowledge required to run a server, let alone program in PHP." It's early days for the service, and feedback and forum postings on the net indicate that the Opera proxies have regularly experienced problems, but it's worth giving it a try if you have simple content to serve. More info at **http://unite.opera.com/support/**.

INTERNET

GOOGLE CHROME EXTENSIONS

Q What's the deal with Google Chrome's primitive bookmarking system, particularly its inability to be synchronised with other instances of the browser on other computers? I love the Chrome browser, but I find its bookmarks inexplicably limited.

Tim Tong

A Could not agree with you more about Chrome's bookmarks. For something so fundamental in a browser, they are rubbish, but even IE8's bookmarks are barely improved since IE6. While Safari's are better, it's only Firefox's bookmarking system that is up to scratch, presenting both folder and tag views and offering plug-ins such as Mozilla Weave or Xmarks to synchronize the bookmarks across multiple instances of the browser.

The best you can do with Chrome is to replace Chrome's in-built non-synchronisable bookmarks with Google Bookmarks, a web-based bookmark service which Google surprisingly didn't think about integrating into Chrome. Go to **www.google.com/bookmarks/** and drag the Google Bookmark bookmarklet to Chrome's links area, while also creating a link to Google Bookmarks. That lets you add bookmarks to a web-based central repository, which you then access as a web page from Chrome on any other PC. You can do the same with del.icio.us, whose bookmarks are arguably more advanced than Google Bookmarks, and can also be shared. However, if you download a late dev-channel version of Chrome (at least 3.0.193.0), you can try the GBX Google Bookmarks Extension for Chrome, which replaces the Chrome bookmarks with those downloaded from Google Bookmarks. This is not an official Google extension but one created by a third party developer frustrated with the lack of synchronisable bookmarks in the browser.

TIP: INTERNET

ONLINE PIANOS

If you're a total musical moron but would still like to create some tunes to play back or to email to someone, head to **www.kisstunes.com**. Unlike most online virtual pianos or synthesisers, KissTunes assumes you have no musical training and lets you create tunes just by typing on 18 selected keys on your PC's Qwerty keyboard. Once you create a tune, you can record it and save and access it from any other computer. If you're looking to play on something that looks more like a piano, go to Virtual Piano, at **tinyurl.com/mt2kvh**. This is still in beta but promises a more piano-like experience, using all the keys on your keyboard.

INTERNET

YAHOO! UNWELCOME

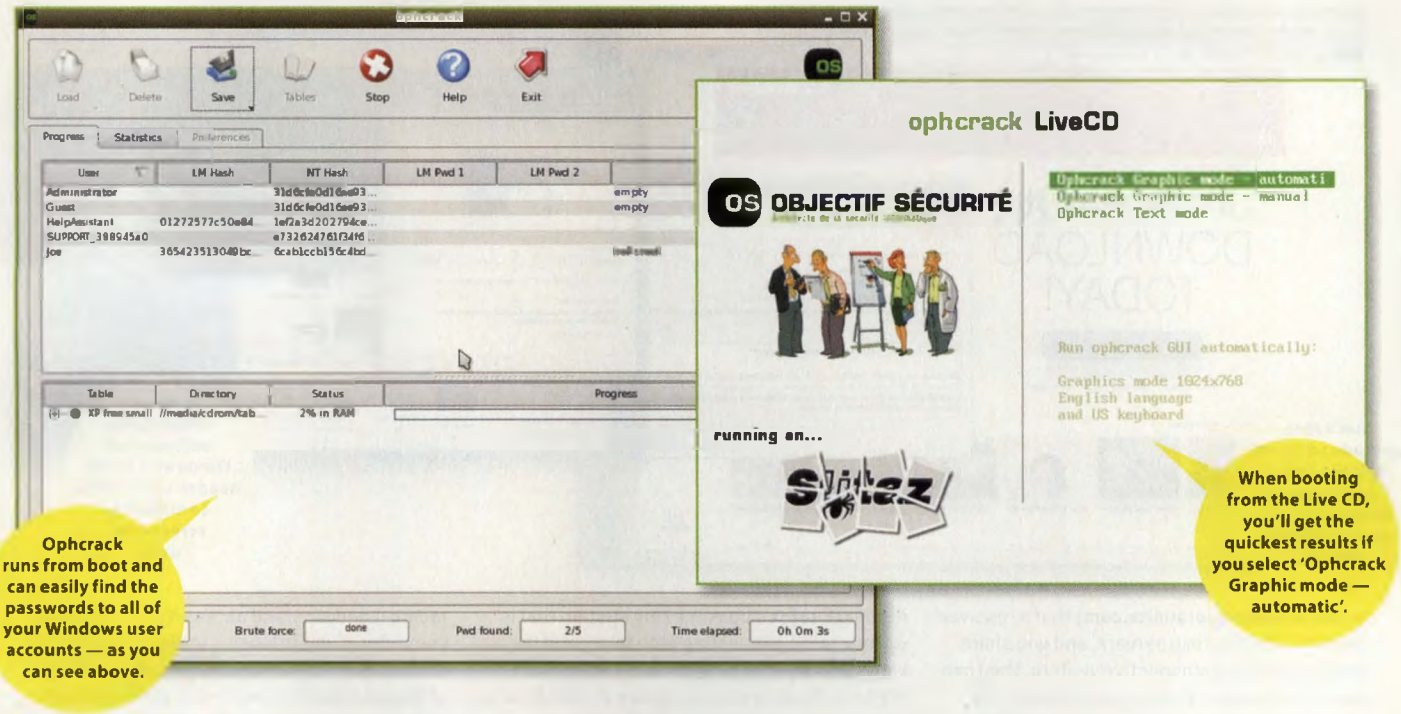
Q The Yahoo! Toolbar was recently added to my Firefox browser without me having downloaded it or given any permission that I know of. OK, I was able to remove it, but I am furious that Yahoo! would take such a liberty, and wonder if you know how the company manages to do this?

Vicki Baxter

A We've received a handful of complaints about this and think we've now isolated the culprit. Let's set the record straight: it's not Yahoo!, it's Sun. This happens because Sun has recently taken to including the Yahoo! toolbar as part of the Java update process. It's one of the apps included under the heading 'Install a free program with Java' when you agree to allow your installation of Java to be upgraded.

To be honest, the screen offering the addition of the toolbar is quite clear about what will happen. But Sun's being quite sneaky here, as most people are far too busy to check everything and will assume that they're upgrading Java alone. If you don't pay too much attention you'll just notice the 'Next' button at the bottom of the dialog and click on it, only to find the Yahoo! toolbar included as a result.

So, if you don't want the toolbar when upgrading Java in the future, you just need to uncheck the box at the top left of the window before moving on.



Ophcrack runs from boot and can easily find the passwords to all of your Windows user accounts — as you can see above.

When booting from the Live CD, you'll get the quickest results if you select 'Ophcrack Graphic mode — automatic'.

We suspect Sun has had a lot of complaints about this, because when we checked again today the 'Install the Yahoo Toolbar' checkbox had been moved to the bottom of the screen near the 'Next' button, making it far more immediately obvious what you're doing.

WINDOWS

RECOVER LOST WINDOWS PASSWORDS

Q When I set up Windows XP, I protected my account with a strong password — which I've now forgotten! The result of this is that I'm locked out of Windows and can't get back in. I'm loathe to reinstall, as this would involve data loss. My documents are set as private and stored on my Windows partition. I want to be able to get at my settings and data in Windows. Is there any way I can recover the forgotten password?

Jeremy Hunt

A Passwords in an encrypted form are what's known as a hash file. With the right software you can examine the hash file and crack the encryption to recover the passwords within it. The program to use is Ophcrack, an open-source password recovery program that you can download from **http://ophcrack.sourceforge.net**.

It works by generating a number of different combinations to crack the passwords by brute force. Because you need access to the hash files concerned, you can't use this as a general cracking program. It won't work to retrieve passwords for web sites or any other passwords that aren't associated with your operating system, but it's very useful for gaining access to accounts when the password has been lost.

However, it would be possible to use the program to recover passwords from someone else's PC if you had direct access to it or could obtain the hash files via an insecure net connection. Clearly this isn't the purpose of the program, but it's worth bearing in mind how it operates so you can protect yourself from those who may use it unscrupulously.

The more data Ophcrack has in its tables, the better the program is at discovering passwords. It's possible to download ISOs of DVDs containing vast tables to use in conjunction with Ophcrack, but in most cases you can get by with the tables offered for download when you install the application.

When you start the program you need to point it at a hash file. The easiest way to do this is to get it to use the local Windows installation. If you can't access that, you can use a boot CD to start the computer and browse to the Windows files from outside Windows itself.

You can download Live CDs in ISO format that work with Windows XP or Vista from **http://ophcrack.sourceforge.net/download.php?type=livecd**. Download the ISO file for your version of Windows and then use a CD-burning program like CD Burner XP (**http://cdburnerxp.se**) to transfer the ISO file to disc.

Now boot your PC using the CD you've just made. If this doesn't work, enter the BIOS and enable booting from CD. Start using the default settings. The disc will automatically launch Ophcrack and find local password files. Note down the password for your account and then you can use it to log into Windows.

You can also download a version of Ophcrack for use inside Windows. You may find this helpful if you have access to one account but not another. Once you've launched the program, choose 'Load > From Local SAM'. This finds all local accounts. Select 'Tables > LM Alphanumeric', and click 'OK' to confirm. Next, select the account whose password you need. To begin the process, click 'Launch'. Once selected, this turns into a stop button. Ophcrack will then load each table and cycle through it until it reaches the end of the tables or it finds each password.

TIP: INTERNET

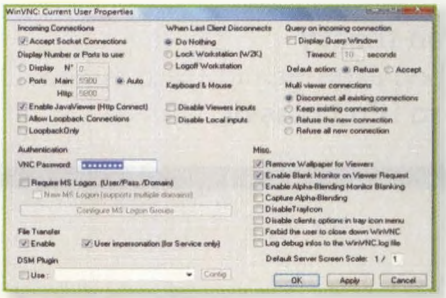
TEST APPLICATIONS IN YOUR BROWSER

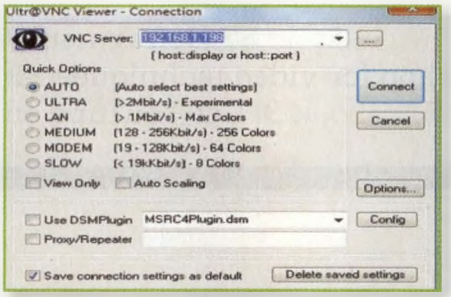
Click2Try (**www.click2try.com**) lets you try a variety of open source programs and Linux distributions via a virtual machine in your web browser without having to install them. It's such an obvious idea it's a wonder no-one has done it before. If you want to take an operating system like Fedora or Ubuntu for a test run but don't want to install it or futz around with a Live CD, log in to Click2Try and fire it up. Same with a web management system like Drupal, or a host of business applications ranging from e-commerce platforms like OS Commerce to a variety of accounting software.

You get the real application, in a virtual java

3 STEPS USE ULTRAVNC TO CONNECT TO A REMOTE PC

Gain access to data on your home computer from any other machine





1 CONFIGURE THE CLIENT

On the client machine you will need to set up some of the options, such as the connection password, and make sure that the encryption plug-ins are enabled. One handy tweak is to set the option to replace the wallpaper with a blue screen in order to reduce bandwidth.

2 ENTER THE IP ADDRESS

To connect to the remote machine, you will need to enter its public IP address if connecting across the internet, or its private IP address if connecting across a local network. Make sure that the encryption plug-ins match the remote machine's settings.

3 ENABLE VNC TRAFFIC

If you're using a router on your network, you'll need to allow the VNC traffic to pass through. Go to the port-forwarding section of your router's set-up menu and enter the port details for the VNC client you're using. You should now be able to access your computer.

machine in your browser, which you then navigate and operate as it were running off the desktop. The free version lets you open one application at a time and gives you up to 1GB of storage space for data generated by the virtual app. Premium versions give you more concurrent applications and data storage, as well as multi-user access.

TIP: INTERNET

ADOBE GOES WEB

When it comes to cloud-based office applications and storage, Google's Apps and Microsoft's Office Live Workspace get the attention, but we love Adobe's Acrobat.com, a suite of free (and premium) Flash-based applications that's just come out of beta and showcase Adobe's mastery of the user interface.

These include Buzzword, easily the most elegant and usable word processor in the cloud today; Adobe ConnectNow, a web conferencing service; Create PDF, a PDF maker and My Store, 5GB of online storage. The basic Acrobat.com suite is free, with the premium version providing more of everything. The related service Acrobat Labs (**http://labs.acrobat.com**) is a bit like Google Labs, with more experimental stuff that presumably will eventually move to Acrobat.com. This includes Acrobat.com Tables, a cross between an online spreadsheet and a database table, and Acrobat.com Presentations, an online version of Powerpoint. What makes Acrobat.com special is that there is an AIR extension that makes some of the online functionality available on your desktop, somewhat like Google Gears. This comes in handy particularly with the file uploading feature.

WINDOWS

AVOID XP MEDIA PLAYER CRASHES

Q I've an odd problem. When I plug my flash memory drive into my PC, Windows Media Player 11 crashes. This, as you can imagine, makes streaming video from my USB drive very difficult. The weird thing is, I can use the drive within Windows and in conjunction with other apps. I can, for example, use it to store photographs and view them within Photoshop Elements. It's just Media Player which seems to dislike it. I'm using Windows XP if that helps you to track down a cure.

Terry Bland

A You're not alone in your problem and Microsoft knows all about it. The crash happens because certain flash memory devices "have non-compliant descriptor layouts". Thanks for that disarming and endearing explanation, Microsoft. In plainer English, when Windows Media Device Manager attempts to read the manufacturer name from the device, a memory violation error occurs. As WMDM runs as part of Windows Media Player, its error brings the larger program to its knees. So that's the explanation of why the problem occurs, but what can be done about it? Thankfully you don't need to ditch your thumb drive. All you need do is download a hotfix from this page — **http://support.microsoft.com/kb/933547**. You didn't tell us whether you're using Windows XP 32-bit or the 64-bit, but both versions of the OS have the problem and you'll find hotfixes for both on that page

WINDOWS

WINDOWS 7 PROBLEMS WITH THE SCREENSAVER

Q I am running the new Windows 7 RC. It generally seems quite robust, but there's one issue I've been unable to solve: the screensaver. I can get it to run by selecting 'Personalise > Screen Saver' and clicking on 'Preview', but when I set the time delay, it refuses to enter the screensaver. How do I fix this?

Callum Bishop

A I would be prepared to bet you that you have a Microsoft keyboard and mouse running Intellipoint software, as this is a known bug that has also cropped up in Windows Vista. There is a hotfix available from Microsoft, but it doesn't show up unless you select the optional updates. To fix your screensaver, go to **http://windowsupdate.microsoft.com in Internet Explorer** (not Firefox, Opera or another browser) and install the optional hardware update named 'Microsoft HID Non-User Input Data Filter'.

86 insider tips

HOW THE PROFESSIONALS DO IT

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WINDOWS VIEW

Keep your life in sync

Live Mesh is great for syncing documents, but you can make it work a bit harder.

APC EXPERT

JAMES BANNAN

James Bannan is a systems manager at St Leonard's College (Vic) and *APC*'s resident Windows expert.

Ever been caught out needing to access a particularly important file or piece of information, only to realise that it's on a different machine? The more machines you access the more likely this is to occur, and a good way around it is to use some sort of synchronisation software, either to a portable storage device or, as is becoming increasingly popular, to the cloud. I've been using Microsoft's Live Mesh for quite some time now, and to be honest I couldn't live without it: it keeps all my most critical data synced across multiple machines and, because the files are cached locally, I can still access them even if I'm offline.

More recently I've started using Mesh to sync more than just documents: IE Favourites are a particularly useful thing to have accessible anywhere. There are plenty of free tools and plug-ins which let you do this, like Zinkmo, but you can do it with Mesh too. Simply navigate to the Favourites folder in Windows Explorer and either right-click on a folder or create a new folder and select 'Add folder to Live Mesh'. If the plan is to sync either the entire Favourites folder or the Favourites Bar in IE8, this is not a good idea if you're also going to sync across different Windows platforms (eg. Vista and Windows 7) as they handle certain folders slightly differently. I created a folder within the Favourites Bar called 'Mesh Links' that syncs happily across every connected machine, and you have the advantage of still being able to have locally-specific links. For example, I don't need a shortcut to my home NAS on my work computer.

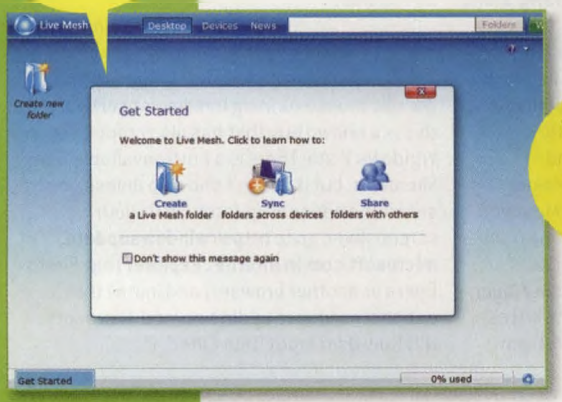
Although I haven't tried it you should also be able to do the same thing with the Firefox cache. Go to %APPDATA%\Mozilla\Firefox\Profiles and there should be one folder in there: this contains all your Firefox favourites and customisations and should be OK to add to Mesh.

On a second computer, run Firefox for the first time and let it create the profile folder structure, then delete the profile folder and sync the Mesh folder to the same location. It's worth checking the folder properties to make sure that *all* files and folders are being synced; depending on what you add to Mesh it has been known to leave certain files behind.

Another useful convenience to have available across all machines is passwords. I often forget a logon to a web site which is stored in the browser on another machine. Using the portable version of KeePass, I can store all my passwords in a secure location and have them available everywhere via Mesh.

The same goes for news feeds; I read lots of them and prefer the ability to read offline. NewsGator FeedDemon is a great RSS client, and because you can modify the location of the offline cache, you can add it to Mesh. Then, install the client on another machine and point to the synced cache and you've got all your offline content ready to go.

Live Mesh enables you to have the same data available on multiple PCs.



Want to sync your IE Favourites? Live Mesh lets you.

Synchronizing life
Sync, share, and access the information you care about—wherever you happen to be.
Share Live Mesh
What is Live Mesh?
What's inside?
Get started

LINUX WINDOW

Defragmentation theory

Even though Linux is better at file storage, it still needs a defrag every once in a while.

APC EXPERT

ASHTON MILLS

Editor of the Linux Pocketbooks series, and now with CHOICE magazine, Ashton has been a tech journo for over 13 years, including five years with *APC*.

There's a reason it's hard to find defragmentation software for Linux. Oh, there's been a few — like 'Shake' and Con Kolivas' (of the -ck kernel patchset fame) appropriately named 'defrag'. Except these are literally scripts that just move files around in userland, and are limited if you want to defrag parts of your root drive (not a good idea for essential files on a running system).

But the reason such tools are few and far between is that, on the whole, Linux doesn't need defragmenting software. Most modern filesystems Linux supports, and especially the staple Ext3 and now Ext4, are very well designed to minimise fragmentation in the first place — among other features, files are spread across the volume of a disk, giving them plenty of room to grow or change and always have a contiguous space nearby to do so.

But there are exceptions: very large files on a busy disk and, of course, as the disk becomes full it will become harder and harder for the filesystem to allocate a contiguous space. Which is why modern filesystems are often touted as defragmentation-*resistant* but not *immune*.

> MODERN FILESYSTEMS ARE TOUTED AS DEFRAG-RESISTANT, NOT IMMUNE

And so there are valid reasons for a defragmentation tool, such as when a disk gets near capacity (typically it's recommended to keep at least 20% free to help the filesystem optimise file allocation) or — more commonly at the moment — when people upgrade from Ext3 to Ext4 and its enhanced structures. As a result, an online (can be used with a running system) defragmentation program, called *e4defrag*, was actually built alongside Ext4.

It currently provides only a few options, though it's likely all you need: single file defragmentation, relevant file defragmentation (eg. moving files related to a directory close together), and free space defragmentation (ensuring sufficient contiguous free space blocks are available).

It sounds like a great tool: it's just not available yet. And there's a good reason for that — it's still in development and, let's face it, reading and re-writing the files on a live system has to be something that's rock solid. However, going by the kernel developer Theordore Tso's posts on the dev lists, merging into the mainline may not be too far off.

When the tool makes it out into the wild, though, it's unlikely Ubuntu will bundle it for at least a short while — there's nothing like real-world feedback to test the stability of a program.

Not that you need to wait on it with bated breath, because remember for the most part Ext4 does a fine job of ensuring your data isn't fragmented in the first place — though it will be interesting, when it arrives, to see just what impact on performance the tool has for various configurations (lightly used volume, close to full volume, desktop and server etc.). Which means, in the meantime, if you want to use Ext4 you'd probably be better off installing it afresh rather than upgrading an Ext3 partition. And if your disk is close to being full, do yourself a favour and free up some space.

So while it can be handy (and yes, even fun, for some of us) to use defragmentation tools like under Windows (and there's a plethora of them) to improve performance, it's not necessarily required for your Linux boot for most configurations, including desktop use, if you ensure there's at least a fifth of your disk free at all times. But when the tool arrives, you too can play with a defragger, if only for peace of mind.

Defrag tools for Linux are not essential, but make sure your hard drive has some spare room.

VIDEO EFFECTS

Use Photoshop for cool video techniques

Want to do some titling on a piece of video but don't have a video editing tool? Adobe's Photoshop CS4 Extended can help.

APC EXPERT

MICHAEL STODDART

Trained as a graphic designer, Michael is Adobe's own Creative Suite guru. A publishing consultant before joining Adobe, Michael has been helping Adobe's regional publishing, advertising and design clients transition to Adobe's Creative Suite tools.

PhotoshopCS4 Extended opens video by linking to it — so you can overlay text, adjustment layers or any other type of layer editing usually done with still images. It's not designed for pixel level editing, but it's great for colour correction, titling and special effects. Firstly, change the Workspace to Video. This not only shows the Panels you need but swaps the KBSC (keyboard shortcuts) so that <crsr> right and left moves one frame forward or back in the timeline.

Open the video file you want to use. Photoshop Extended can open Quicktime video in MPEG-1 (.mpg or .mpeg), MPEG-4 (.mp4 or .m4v), MOV, AVI, FLV (if Adobe Flash Professional is installed) or MPEG-2 (if an MPEG-2 encoder is installed on your computer).

To add some titles, use the text tool and click on the video frame to enter a text layer, type the text, then add some Layer Effects (shadow, glow, emboss) as needed (click the 'fx' icon at the bottom of the Layers panel).

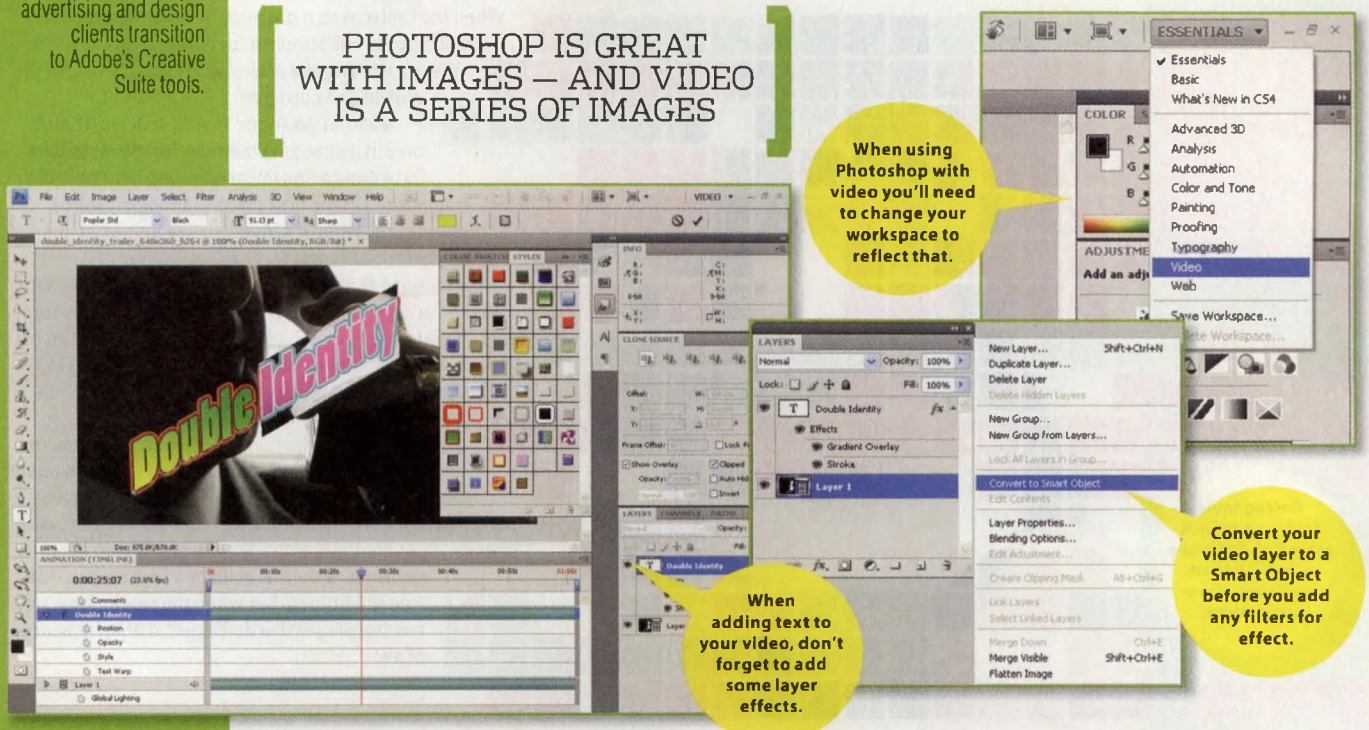
Using the Timeline Panel, click the disclosure triangles next to the layer names — these show the stopwatch icons for setting keyframes to change Position, Opacity or Style. For the text layer, set the Opacity to zero (using the Layers panel), move the Current Time Marker (CTM) — the red line — to when you want the text to appear, and change the Opacity back to 100%. If you want the text to disappear, move or change style, just move the CTM and make the changes. Photoshop will insert the keyframes as needed.

You can apply Filters to the video for cool effects — the trick is to first convert the video layer to a Smart Object (otherwise the filter will only apply to a single frame). Use the Layers panel to select the video layer, and then from the flyout menu choose "Convert to Smart Object". You're now free to use the Filter Gallery to apply as many filters as you like. Building up layers of filters can generate subtle effects.

When it comes time to output your video, simply go to File > Export > Render Video. You can render the footage in a number of formats — AVI, Quicktime or, if you have Photoshop Extended installed as part of the Creative Suite, you can also render direct to Flash Video for uploading to the web.

Photoshop has always been great with images — and what's video if not a series of images? Use your Photoshop expertise to branch out into video.

> PHOTOSHOP IS GREAT WITH IMAGES — AND VIDEO IS A SERIES OF IMAGES



IPHONE

Location-based iPhone services

Use your iPhone's GPS feature for everything from recommending nearby restaurants to finding the nearest free Wi-Fi at Maccas.

APC EXPERT

JENNETH ORANTIA

An expert on all things mobile, Jenneth Orantia has been writing reviews and tutorials on smartphones for the last seven years. Her current phone of choice is the iPhone 3G, but she's also well-versed in Windows Mobile, Symbian, Palm and BlackBerry.

Out of the box, the iPhone's GPS feature works with the camera to geo-tag photos and Google Maps for basic navigation. But you can use it in more interesting ways. With iPhone OS 3.0, Apple lifted the restriction on turn-by-turn navigation, and while TomTom was the first to announce an iPhone navigation program, a little-known Slovakian company, Sygic, was the first (and, thus far, only) developer to offer one with Australia and New Zealand maps.

We'll have a full review of Sygic Mobile Maps in the next issue of *APC*, but our initial impressions are positive. For an iPhone application, its $79.99 pricetag marks it as one of the most expensive programs in the iTunes Store, but since it includes all of the features you'd expect in a standalone GPS worth three times as much, we consider it good value.

If you don't need the full turn-by-turn mapping function, AroundMe is an excellent free program that taps into the Google Maps info to pull up points of interest that are nearby. If you've used the native Google Maps application on your iPhone before, you'll know how slow it is to find anything. AroundMe is the opposite: it loads quickly, presents all of the main points of interest, categories like petrol stations, parking and banks, and retrieves a list of close by places. Clicking through to any of the listings brings up the map view with quick links to call the place, email the details or add it as a favourite or contact.

AroundMe includes restaurants as one of the points of interest categories, but if you want more details, the free Urbanspoon application is an interactive application that can help you find a good place to eat. Clicking on the 'Near Me' option will list all of the restaurants that are close by, and you can sort it by distance, name and popularity. Each listing includes the address, menu (not all of the listings have one), critic and user reviews, and options to like it or dislike it, write a review or 'tweet' it. You can also browse through restaurants by suburb and food type, and there's an option to connect to your Facebook account so you can see what other Urbanspoon users have recommended.

RunKeeper Free is a nice complement to Urbanspoon and can help you keep track of all of the running or cycling you do to burn off all that rich restaurant food. It works similarly to Nike+ by using the iPhone's GPS to track stats like distance, duration and pace. It keeps track of all of your workouts, and you can see a map of the trail you use each time. There's also a free online dashboard that you can log into for seeing more detailed stats, including the calories burned and elevation of the trail.

There are also a few programs that use the iPhone's GPS in less obvious ways. If you're an avid Twitterer, some of the Twitter clients like Twitterific and Tweetie let you see tweets from users that are in your area. The latest update to Shazam, a free application that tells you the song that's currently playing, now includes a geotagging function so you can see where you heard particular songs. Finally, the Macca's Free Wi-Fi Store Locator will show you the nearest McDonalds with free Wi-Fi.

BUILDING A PC

Say 'no' to Facebook

Need help with how to control your addiction to Facebook? Try these tips.

APC EXPERT

SAMANTHA ROSE-HUNT

Samantha is a young internet writer fascinated by the impact of social networking services such as Twitter and Facebook on how we live and work, not just how we socialise.

These days I am finding myself addicted to the tiny red Facebook icon in the bottom right-hand corner of my screen. I post a photo and check back every two seconds to see what others think. This approval-seeking behaviour is not me; it's not normal. It is as if something has crawled deep inside my brain and taken over. I think I am addicted to Facebook. If you find yourself struggling with a similar issue, I have come up with a few tricks that might help you to reclaim your life and step away from your computer.

KNOWING IS HALF THE BATTLE

Addiction to Facebook is marked by many symptoms. Classic ones are if you wake up in the morning and Facebook is the first thing that comes to mind, if you update your status at least 10 times a day, or if you excessively check your updates on your mobile device, even while having dinner with a friend.

CURING THE ADDICTION

1 Set Boundaries

It is important that you make a decision as to how much time you can afford to devote to Facebook each day. Assign time limits to each task so you know you will only be spending a specific amount of time on the service. You must make yourself accountable or else the addiction is impossible to control.

If you have trouble sticking to a specific schedule, assigning a specific time of the day to visit the site is also an excellent idea. If you know that you can spare an hour around 2pm, use that hour for Facebook. Once the hour is up, sign off and step away from the computer.

2 Cease notifications

One of the major reasons I log into Facebook is temptation. Text message and email alerts often strike within me an urge to head straight to the site to see what "Nancy" had to say about my funny Tweet from earlier. Changing the notification settings on your account to not notify you will aid in this. If you don't know you have a message you might feel less inclined to log on.

3 Think of other things you could be doing

Most people have no idea how much time is actually wasted on Facebook and other social networking sites. It might be a good idea to track your usage for a day and write down each time you log on and off and calculate just how much time was wasted. There are so many other things that one could do during this time period. Make a list of the things you could do. You could go shopping, go to the park, write in a journal, take a class, go to the library, watch a movie, read a book, take the dog for a walk, go for a swim, go to the gym, volunteer. Activity is endless. Facebook is not your entire life. Find other things that you can fill your time with.

4 If all else fails, block it

If you can't seem to kick the habit — I know, it can be hard — a great suggestion (and last resort) is to block the Facebook web site and your access. This can be done by clicking on Start, selecting Run, type "notepad c:\WINDOWS\system32\drivers\etc\hosts" and, when the code shows, scroll down and type "127.0.0.1 facebook.com". This will block Facebook from showing on your PC until the site has been unblocked.

Just like anything else, utilising social networks requires discipline that some can't handle. Though this was written as a tongue-in-cheek concept there is no doubt in my mind I struggle from Facebook overuse, and these techniques will aid you in being more productive and reducing your time wasted trolling, stalking and oversharing on the web. Good Luck!

IPOD

Get YouTube on an iPod classic or nano

So what if you don't have Wi-Fi? Here are three smart ways to get your favourite YouTube clips onto your iPod.

APC EXPERT

JENNETH ORANTIA

An expert on all things mobile, Jenneth Orantia has been writing reviews and tutorials on smartphones for the last seven years. Her current phone of choice is the iPhone 3G, but she's also well-versed in Windows Mobile, Symbian, Palm and BlackBerry.

The traditional iPods like the classic and nano may not be getting as much airtime these days as the hallowed iPhone, but if your needs only extend to music and video playback, then they're still the best tools for the job.

Still, with so many video clips and music videos making their way onto YouTube, being able to tap into that goldmine would make a nice change of pace when you get bored of your existing media library. iPod touch and iPhone users can access YouTube on-the-fly via Wi-Fi or 3G, but with only a little forward planning, iPod classic and nano users can also get in on the action.

You'll still need a desktop computer as a middleman, but the following three free programs and services save you from lots of manual fiddling and converting.

For downloading clips directly from a YouTube page or any site with an embedded YouTube clip, the MP4 YouTube Downloader add-on for Firefox (**http://tinyurl.com/kwh5kn**) will do the trick. Once it's installed (and you've restarted Firefox), all you have to do is right-click and select 'Download video as MP4' in the context menu. Once done, just transfer it over to your iPod using iTunes.

MP4 YouTube Downloader works well for grabbing one video at a time, but what if you're in a hurry and want to download a whole bunch of clips at once? This is where the freeware Tooble application (**www.tooble.tv**) comes in handy. Tooble is a YouTube front-end that lets you browse clips by category and popularity and download them in batches. You can also search for particular videos and enter the URL of a YouTube clip embedded into another site.

Toodle downloads the clips in YouTube's native FLV format, but it transcodes them on-the-fly to MP4 and automatically transfers them to your iTunes Movies library.

The last tool is the most powerful. RSSHandler (**www.rsshandler.com**) is an online service that converts YouTube channels, playlists and standard feeds into podcasts that you can subscribe to in iTunes. Essentially, it tricks iTunes into downloading all of the videos for you.

If you're a Pink fan, for instance, you could use the YouTube RSS Channel Converter (**www.rsshandler.com/converter**) and enter **http://www.youtube.com/user/PinkVideoVault** as the Channel URL. Select the 'MP4 (iTunes)' format, then click Generate. This will give you an RSS URL that you can then 'subscribe to' as a podcast.

Copy the generated URL, then open iTunes and click on Podcasts in the left-hand pane. Go to 'Advanced > Subscribe to Podcast' and paste the URL in. It will now appear as a podcast in the main view. Double click on the thumbnail, and you'll see all the videos listed in that YouTube channel. To download all of them, simply click 'Get All', and make yourself a cup of coffee while they download three at a time.

The Playlist feature works the same way, but with playlists rather than channels. Find a playlist you'd like to subscribe to (we used the Family Guy 'top 100 funniest Family Guy clips ever uploaded' to test it). Get the playlist ID (the string of characters and numerals at the end of the URL) and paste it into RSSHandler's YouTube Playlist video RSS podcast section. Repeat the same steps from the previous paragraph.

If you don't have any particular videos in mind, you can create a podcast from YouTube's standard feeds, which include Recently Featured, Most Viewed, Most Popular and Top Rated.

For any of the podcasts that you create, you can configure iTunes to check for new episodes on an hourly, daily or weekly basis, which means you can have new YouTube clips on your iPod every time you sync it. apc

Don't have an iPhone to watch funny clips on the go? Never mind, if you're organised your iPod can help.

YouTube
MICHAEL JACKSON Last Concert Footage Staples Center Rehearsal Clip 2009 AEG Live LLC
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OPEN SOURCE CHALLENGE

Maximising VirtualBox

VirtualBox is a great tool to virtualise operating systems on Linux and Windows. Here's how to make the most of it.

APC EXPERT

ASHTON MILLS

Ashton has been using Linux since Slackware came on floppies, and before that he was one of the three people in the world who used OS/2 (and loved it). Always ready to make the most of his PCs, he is constantly playing with Linux distributions and compiling the latest kernel. This is his idea of fun, and why we get him to write for *you*.

VirtualBox is an excellent tool for sandboxing Linux distributions, not to mention Windows. It allows you to 'try before you buy' on operating systems you might install on your PC, as well as provide a secure environment to run applications you might not normally be able to run directly on your desktop. And its excellent performance and straightforward GUI make it easy to set up and use, but some of the better features can be fiddly to get working.

USB DEVICES

USB support for guest operating systems is eminently useful — you can use USB keys to transfer data, or plug in USB devices like webcams and iPods for example. Anything the guest OS and applications can use via USB as if it were the host. By default the version of VirtualBox bundled with Ubuntu is the OSE, the Open Source Edition. This doesn't include USB support, a feature reserved for the binary-only enterprise version, which is still free for personal use under the PUEL (Personal Use and Evaluation Licence). This means it can't be distributed with Ubuntu, but it can be freely downloaded directly from VirtualBox for personal use.

So head to **www.virtualbox.org**, click on Downloads then 'VirtualBox for Linux hosts' and grab the Ubuntu packages for your architecture, then install them (uninstalling VirtualBox OSE first if installed from Ubuntu). Once that's done and you've set up a guest OS, click Settings on the profile of the guest OS followed by USB in the left hand panel. Tick to ensure the USB controller is enabled, with USB 2.0 support to boot, and then under 'USB Device Filters', click the USB plug icon with the blue circle — 'Add Empty Filter'. Add as many empty filters as you intend USB devices to use simultaneously.

You can, alternatively, add filters for very specific devices only with the '+' icon, but unless you're trying to securely prevent what someone can use, a blank filter ensures any device can be plugged in. Finally, the user running VirtualBox needs to belong to the VirtualBox group, or USB devices won't be recognised in the guest OS. To do this, click 'System > Administration > Users and Groups'. Click Unlock and enter your password. For your chosen user accounts, highlight and click Properties. Under User Privileges, scroll down to 'Use VirtualBox' and tick it.

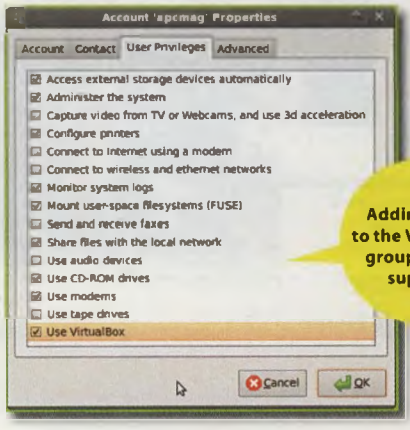
Note that any device you plug in while the guest OS is active will be visible to the guest. The moment you close the guest OS, your Linux host will 'see' the USB device. Any device already plugged into the host before the guest OS is launched won't be visible in the guest until you remove it and re-insert it, allowing the guest OS to detect it.

SATA SUPPORT

By default VirtualBox will provide the most compatible controller support through IDE, but it also supports SATA if you use the binary PUEL edition. SATA provides better I/O performance for a virtualised OS just as it does in the real world — but you need to explicitly tell VirtualBox to provide a SATA interface, and you then need to ensure the OS uses it. To enable SATA support select a profile and click Settings. In the left menu select Hard Disks, then tick 'Enable Additional Controller' and, in the drop-down box, select 'SATA (AHCI)'.

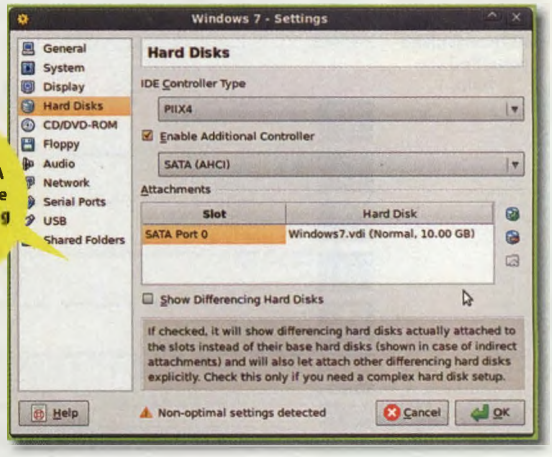
Under attachments you should already see the virtual hard drive you created when you made the profile. Under Slot it will say 'IDE Primary Master'; click on this title and, from the drop-down box, select 'SATA Port 0'.

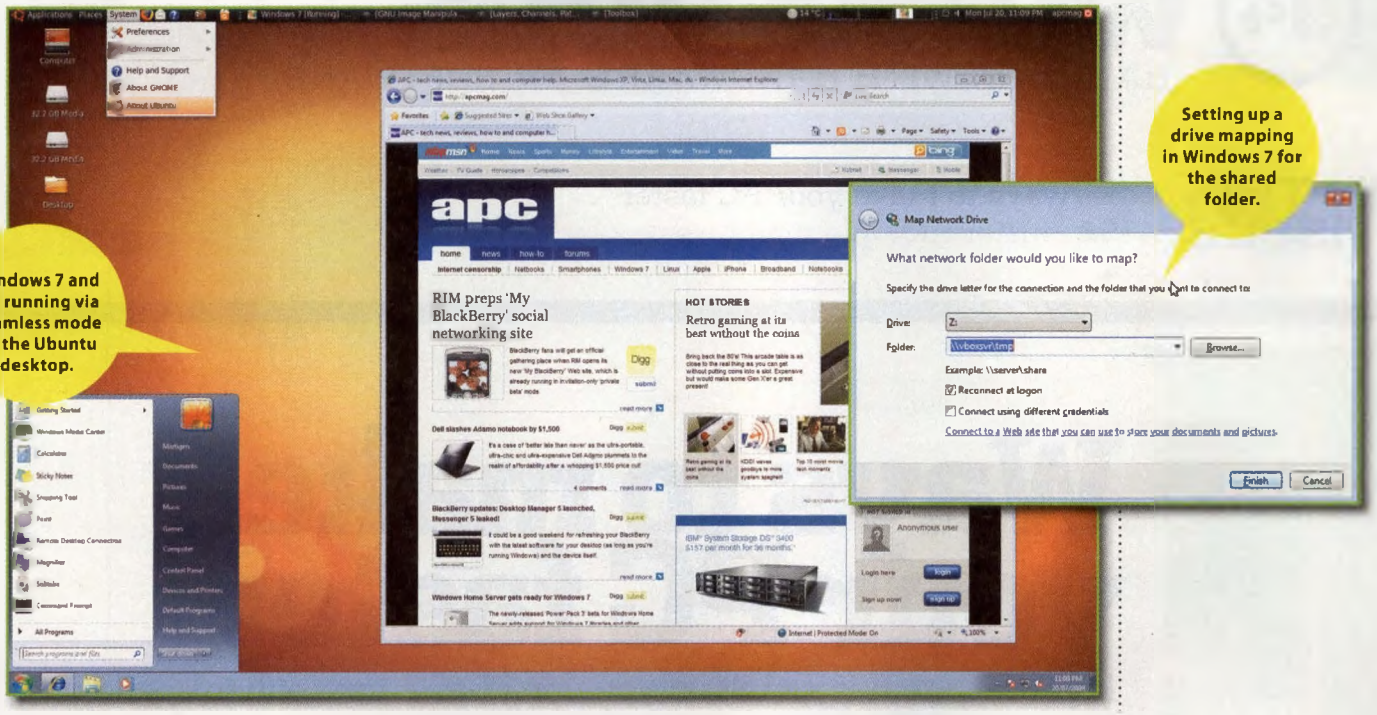
For Linux distributions you don't need to do anything else — most distributions modularise drivers, and these are



Adding a user to the VirtualBox group for USB support.

Enabling SATA support for the guest operating system.




Windows 7 and IE8 running via Seamless mode on the Ubuntu desktop.
Setting up a drive mapping in Windows 7 for the shared folder.
Map Network Drive
What network folder would you like to map?
Drive:
Folder:
Browse...
Example: \\server\share
Reconnect at logon
Connect using different credentials
Finish
Cancel

dynamically loaded at bootup. The SATA 'hardware' will be detected in the guest Linux distribution and the appropriate driver loaded when it boots. Windows is a different matter. Windows is usually tied closely to underlying hardware, and not only will the appropriate SATA drivers not be installed, but Windows' internal mapping of devices may be upset if you enable SATA support after Windows has already been installed. Ideally, you want to setup SATA in VirtualBox and then install Windows, allowing it to detect and use the SATA controller from the get-go.

SHARED FOLDER

The shared folder functionality presents a real local directory as a device or networkable shared folder to a guest OS. To use this feature you need to first install the Guest Additions into the guest OS. To add a folder, click on the Settings for a given profile followed by Shared Folders in the left hand menu. In the right pane, click on the 'plus' folder icon, type in or browse for a path in the Folder Path drop-down box and finally enter a share name for Folder Name.

When selecting a directory, it's a good idea to create a new one just for the purpose of sharing files between host and guest. And, keep in mind, if you want to be able to write to it from the guest you will need write permissions to the folder for your user under Linux. The easiest way to ensure this is to just create the folder yourself in your home directory or on your desktop.

In a Linux guest you can directly mount the share like any other device, only specify 'vboxsf' as the filesystem:

```
mount -t vboxsf [share name] [mount point]
```

In a Windows guest you can also directly attach if you're familiar with the 'net' command; however, there's an easier way: open up Explorer, then press Alt once. This should bring down the old Windows XP 'File, Edit, View' et al menus that are hidden by default in Vista and Windows 7. From there click 'Tools > Map network drive...' to bring up the mapping dialog. Select a Drive letter to allocate and then, in the Folder field, type in the path to the VirtualBox server with your shared file directory. For example, if you called your shared folder 'desktop', you would use:

```
\\vboxsvr\desktop
```

This is an easy, and fast, way to share files between guest and host.

SEAMLESS MODE

When you load a guest operating system in VirtualBox it does so within its own window on the desktop. This is usually how you want it to keep the operating system distinct from the host — however VirtualBox sports an interesting feature called 'Seamless mode' which will, for the most part, integrate the guest OS directly onto the host desktop. If tweaked a little, this can enable you to run, for example, a native Windows application in a VirtualBox guest, but which appears on your Linux desktop as an individual application.

Enabling Seamless Mode is done with a quick tap of the Host+L keys (by default, Host is defined as the Right Ctrl key in VirtualBox), but you may notice the Windows task bar now fighting it out over real estate on your Gnome Linux desktop. If you intend to use Seamless Mode seriously, an easy way to manage this is to remove the bottom Gnome panel (drag any apps to the top panel you want to keep, remembering to unlock them first) and play with auto-hiding task bars.

It's not an always perfect integration; your video drivers may have a say in the matter, but it will allow you to have both Linux desktop and Windows desktop taskbars visible on your desktop, in addition to running apps from both side-by-side. It's as close to simultaneous dual-operating system nirvana as you're likely to get, and as long as you have enough RAM to run two operating systems and their programs at once, it's darn impressive to boot! apc

DO THIS... INSTALLING GUEST ADDITIONS

At the time of writing, the latest VirtualBox is 3.02, downloadable directly from the VirtualBox web site at *www.virtualbox.org*. Within this is included, for your guest operating systems, the 'Guest Additions' CD. In both Windows and Linux you make this visible to the guest OS by clicking 'Devices > Install Guest Additions'. Once mounted, browse to the CD as you normally would and run the appropriate installer for Windows or Linux. Guest Additions are essential to get accelerated video, shared folder support, mouse tracking (so you don't have to switch to and from the guest OS with the Host key) and more.

94 workshops
HANDS-ON WITH HARDWARE & SOFTWARE

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OPTIMISATION

Ways to make your PC faster

If your system is slow and you don't have any cash to spend on upgrades, **Mike William's** got the answers.

WHAT YOU'LL NEED

A SLUGGISH PC

These tips are designed to clean out and clean up your slower than usual PC.

It's the first law of computing: no PC can ever be fast enough. If you're like us, you'll always want to squeeze that little bit of extra power out of your system and make it more productive, preferably without spending a cent. But how? Search online and you'll find plenty of 'quick fix' solutions, all promising massive performance gains if you follow their recommendations. That sounds great, until you realise just how ineffective most of them are. Cleaning your Registry will rarely make any noticeable difference to system performance. Memory optimisers perform no useful function at all. And even commercial tweaking tools often include dubious Registry tweaks that either don't work (IRQ#Priority), are very outdated (AlwaysUnloadDLL and IoPageLockLimit) or can even slow your system down (DisablePagingExecutive and LargeSystemCache). In short, there are no magic bullets, no one-stop fixes that will solve all of your performance problems — but there are tweaks that solve issues one by one.

WINDOWS

Most Windows tweaks only offer a small effect on one part of your PC's operations. Put them all together, though, and you can save considerable time, RAM and system resources, which all helps make your system faster and more responsive.

1 STREAMLINE PC STARTUP

Your PC will boot more quickly if you give it less work to do at startup. Remove discs from your DVD drives and Windows won't wait while they spin up. Unplug USB devices you won't be using and your system won't load drivers. Finally, use Autoruns (**www.tinyurl.com/39338j**) to display and limit the number of programs that launch with Windows and use Startup Delayer (**www.r2.com.au**) to postpone launching non-critical programs for a minute or two, letting your PC focus on booting up instead of running apps.

2 DISABLE SERVICES

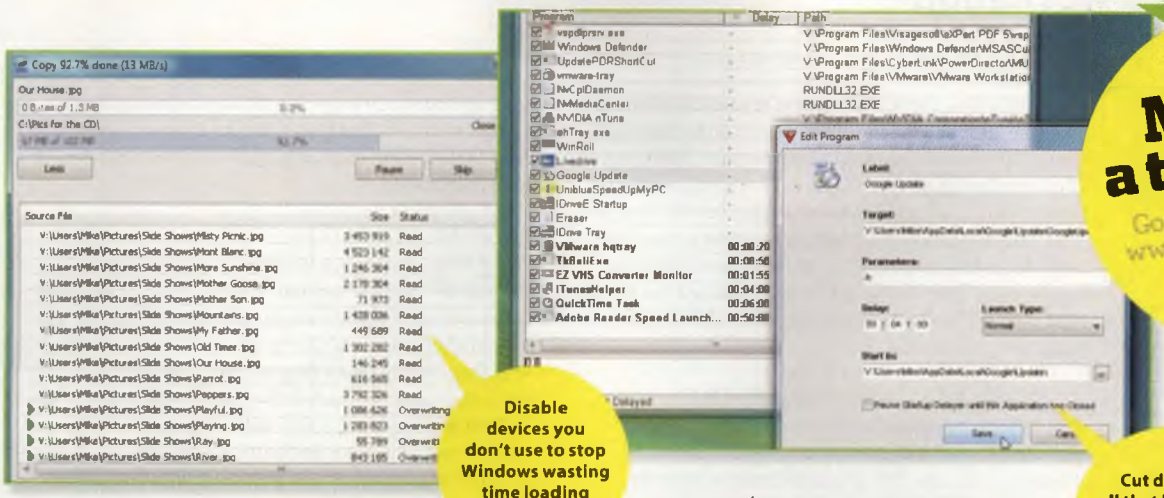
Save your system resources by disabling unnecessary services. If you have Windows Vista and don't use Media Center, for instance, then launch 'services.msc,' double-click the Windows Media Center Extender, Receiver and Scheduler services and set their Startup Type to 'Disabled'. Black Viper's web site (**www.blackviper.com**) has more. Vista users can also delay the launch of non-critical services, which can help your PC to start a little faster. To try this out, launch services.msc, double-click something you won't need immediately and set its Startup Type to 'Automatic (delayed start)'. Now reboot to see if it makes a noticeable change.

3 DECREASE WAITING TIME

If your PC has two or more operating systems then you'll see a boot menu when it starts. To decrease the amount of time it waits before choosing the default setting, right-click Computer, select 'Properties > Advanced system settings > Startup and recovery settings', choose your default OS and set the 'Time to display list of operating systems' to something like 10 seconds.

4 BROWSE THE EVENT VIEWER

Windows Vista analyses every boot and shutdown, then records any programs that are slowing you down. To have a look for yourself, launch 'eventvwr.msc', expand 'Applications and services logs > Microsoft >


Missed a tutorial?
Go to apcmag.com or www.magshop.com.au for back issues of APC
Disable devices you don't use to stop Windows wasting time loading drivers.
Cut down on all that boot-time disk thrashing with the Startup Delayer.

Windows > Diagnostics – performance > Operational', and click on the 'Warning', 'Error' and 'Critical' events. Sometimes Vista gets this wrong, but if the same name keeps coming up then remove, update or reinstall the app to speed up your PC.

5 PRIORITISE PROGRAMS

If you're running programs simultaneously but one is particularly important, you can make the CPU give it high priority. To do so, press Ctrl+Shift+Esc to launch Task Manager, right-click the app and select 'Go to process'. Then right-click the process, select 'Set priority > Above normal', and it will get more CPU time. Alternatively, set a resource-hogging app to 'Below normal' priority and other programs should become faster. Don't tweak critical or system processes, though, or your PC may crash.

6 RECOVER VISTA RESOURCES

If you don't use the sidebar then right-click it, select 'Properties' and clear 'Start Sidebar' to prevent it loading in future. If you've installed your own antivirus software you don't need Windows Defender. Launch Defender, click 'Tools > Options', scroll down to 'Administrator options' and deselect the 'Use Windows Defender' box. You can also turn off Aero to save RAM, or optimise it by right-clicking Computer, selecting 'Properties > Advanced > Performance settings' and choosing 'Adjust for best performance'. The indexing service is useful, helping you find files and folders at speed, and it only runs when your PC is idle. Still, some say turning it off makes a real difference.

If you rarely use the search function then launch 'services.msc', double-click Windows Search, click 'Stop' and set Startup Type to 'Disabled' to turn it off.

7 REPLACE WINDOWS SEARCH

If you have turned Windows searching off, replace it with the utility Everything (**www.voidtools.com**). This runs far more quickly, and it builds its database from the NTFS Master File Table, so no disk crawling is required. It only works with NTFS though, and can't search the contents of files. If your search problems are with Outlook, take a look at Xobni (**www.xobni.com**), which the authors say is up to 50 times faster than the default Windows keyword search.

8 COPY MORE QUICKLY

If Windows takes forever to copy files, use TeraCopy (**www.codesector.com/teracopy.php**) or FastCopy (**www.ipmsg.org/tools/fastcopy.html.en**) instead. These apps deliver better performance and handy extras like the ability to pause the copy process. Use Fling (**www.nchsoftware.com/fling**) to schedule network or FTP transfers to take place when you're not around.

9 USE SPEEDY DNS SERVERS

When you enter a domain name into your browser, it has to be resolved into an IP address by your ISP's DNS server. If this is overloaded then there will always be a browsing delay. Fortunately, OpenDNS has fast alternative DNS servers that you can use for free. To try OpenDNS, launch 'NCPA.CPL', right-click your internet connection and select 'Properties'. Click 'Internet Protocol (TCP/IP)' and hit 'Properties' (use 'v4' on Vista), then choose 'Use the following DNS server addresses' and enter '208.67.222.222' in the 'Preferred' and '208.67.220.220' in the 'Alternate' boxes.

10 PUT YOUR PC TO SLEEP

If you have Vista, choose 'Sleep' rather than 'Shutdown' to save some time the next time you want to use your machine. Windows saves the state of your PC rather than closing it, which means it turns off (and reboots later) far more quickly. Or at least that's the plan. If Sleep won't work for you then it's probably a driver problem. Check the Event Log to see what's going wrong.

11 REDUCE TASK SWITCHING

Regular editions of Windows switch rapidly from one program to another, ensuring a responsive user interface. But each task switch is an overhead, wasting CPU time.

If you don't need a highly responsive interface — you're using Microsoft Office rather than playing 3D games, say — then giving each app more CPU time before moving to the next will cut task switching, making your PC more efficient. Right-click Computer, select 'Properties > Advanced system settings > Performance settings > Advanced' and select 'Adjust for best performance of the background services'. Restore the normal setting if apps seem less responsive.

12 CLEAN UP YOUR DISK

Removing junk from your drive can improve performance, even if it still has hundreds of gigabytes of free space. Uninstall unwanted programs with

DO THIS... AUTO LOG IN

If you're the only person who uses your PC, you can save time by logging in automatically. Be aware that this does introduce a security risk, however, as anyone with access to your system can do the same thing. Launch the command 'control userpasswords2', uncheck 'Users must enter a user name and password', click 'OK', enter the log-on user name and password if you're prompted and click 'OK' again to enable automatic login.

DO THIS... INSTALL ONLY WHAT YOU NEED

If you normally select the 'Complete' option when you install a program, you might end up with all kinds of features that you never use. Get in the habit of selecting the 'Custom' option instead and pick only what you need.

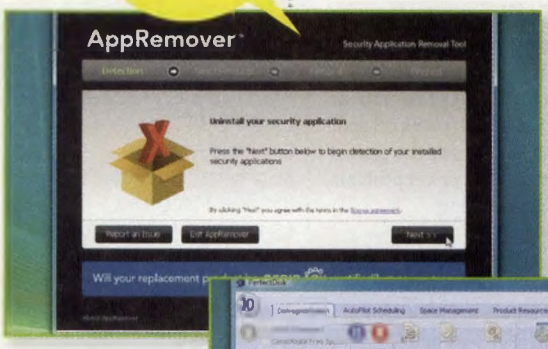
Windows or Revo Uninstaller (**www.revouninstaller.com**). Likewise, stubborn security programs can be expunged using AppRemover (**www.appremover.com**). Next, try Windows Disk Cleanup or CCleaner (**www.ccleaner.com**) to remove redundant files. Manually browse the 'Program Files' and 'Windows\Temp' folders for unnecessary files and folders (only delete what you're sure is safe to go.) Finally, click 'Start' (then 'Run' if you're using XP or earlier), type '%TEMP%' and hit Enter to inspect and clear your User Temporary Files folder.

13 MOVE YOUR PAGING FILE

Relocate the Windows paging file to a second physical drive (not a partition) different to the one that your applications are on to enable your PC to read and write to both simultaneously. This will speed things up noticeably. To do this, right-click Computer, select 'Properties' and click 'Advanced (System Settings) > Performance settings > Advanced > Change'. Clear 'Automatically manage paging file', click your current drive, select 'No paging file' and then 'Set'. Next, select the drive you want to use for the paging file, select 'System managed size', click 'Set', then 'OK' and reboot to see the results.

14 ACCELERATE EXPLORER

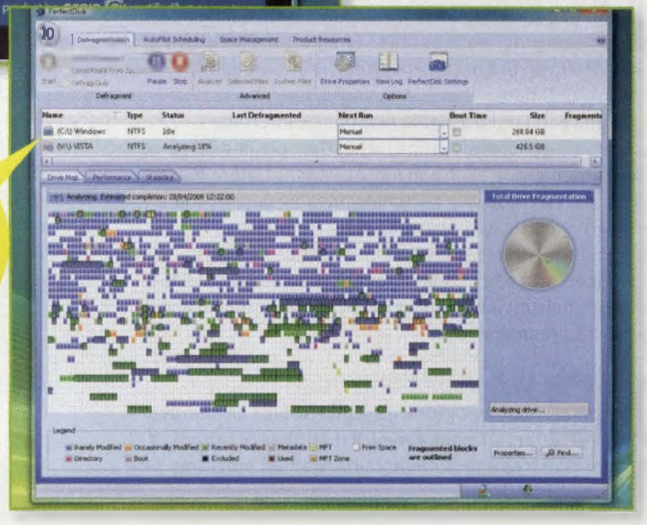
By default Windows XP regularly scans for new network printers and folders, adding anything it finds to My Network Places or the Printers folder. But if you rarely access network resources then this just slows you down. Click 'Start > Control Panel > Appearances and themes > Folder options > View', and clear 'Automatically search for network folders and printers' to stop it doing so.



AppRemover properly uninstalls every trace of even the most stubborn and troublesome security apps.

15 REMOVE FONTS

Most PCs accumulate fonts over time, reducing performance as your system spends time processing them. It's a good idea to remove fonts you never use, as long as you're careful — deleting important fonts can have all kinds of strange effects. Opt for the odd script, foreign or symbol fonts first. If in doubt leave it alone and copy all your fonts to a backup folder first so that they're easily reinstalled.



PerfectDisk 10 will thoroughly defrag your hard drive, making it run faster.

16 DEFRAG THOROUGHLY

The regular Windows defrag tool can't defragment files that are open for exclusive access, which means that your paging and Registry files remain untouched. Fortunately there's a free tool that can help. PageDefrag (**www.tinyurl.com/3cb6xt**) runs during the boot process and can defragment these system files without any trouble. It's also worth trying a commercial app. PerfectDisk (**www.perfectdisk.com**) delivers the best results in our experience — get the 30-day trial and see how it works for you.

17 GO FOR SPEED OVER POWER

Windows Vista's power options can turn off many optimisations in its effort to save energy, so if you prefer speed then it's important to confirm you're set up correctly. Click 'Control Panel > System and maintenance > Power options' and make sure you're using the High Performance plan. Next, click the 'Change plan settings' link under 'High performance' to make sure that you're using the fastest option for each setting.

18 SPEED UP THE START MENU

Make Windows open menus more quickly with a quick Registry change. Just go to 'HKEY_CURRENT_USER\Control Panel\Desktop', double-click 'MenuShowDelay' and change it from the default 400 (milliseconds) to something smaller: 100ms works for us. Restart Windows to see the results.

19 TUNE NTFS

If you don't use old 16-bit software, launch REGEDIT and browse to 'HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\FileSystem', then set 'NtfsDisable8 dot3NameCreation' to 1. Windows will no longer create DOS-style shortened versions of file names, speeding up file creation. Set 'NtfsDisableLastAccessUpdate' to 1 and Windows won't update the Last Access date on a folder when you view it, delivering a small boost to drive performance. These options can break older software, so test your PC thoroughly afterwards.

APPLICATIONS

Tweaking Windows is a good way to speed up your system. Optimising your hardware is even better. But if you really want a faster PC, there's no substitute for properly setting up the software that's going to be doing all the hard work: your favourite applications.

20 OPTIMISE FIREFOX

Firefox stores its data in self-contained SQLite databases, and these can be compacted in order to recover a little performance. You could do this by downloading the command-line tool Sqlite3 (**www.sqlite.org/download.html**) and then using the

command 'for %i in (*.sqlite) do @echo VACUUM; > sqlite3 %i' to compact all SQLite files in the current folder. However, it's much easier to install the SQLite Manager Firefox add-on (**www.tinyurl.com/czadbj**). After you've done this, navigate to 'Tools > SQLite Manager > Database > Connect database' and browse to one of the large '.sqlite' files in your Mozilla profile. Note its current size, click 'Database > Compact database', and check the size again — our 'urlclassifier3.sqlite' database dropped by 40MB.

21 SPEED UP ITUNES

Help iTunes run a little faster by disabling features that you don't use. If you don't ever look at the Genius recommendations, click 'Store > Turn off Genius' to give a small performance boost. If you're not on a large network or don't want to share your library, click 'Edit > Preferences > Sharing' and turn off 'Look for shared libraries' and 'Share my library'. If you don't use Apple TV, click the Apple TV tab and clear 'Look for Apple TVs'. Finally, click the Devices tab and clear any unnecessary 'Look for...' options. Large libraries are the main reason for poor iTunes performance. Click 'Music' in the Library section, then hold down Shift and choose 'File > Show exact duplicates' to look for multiple copies of songs. Delete any you don't need and then browse the library to remove other songs you don't play any more.

22 UPGRADE YOUR SOFTWARE

UpdateStar (**www.updatestar.com**) will scan your programs and report any it recognises that have updates available. Installing these should get you bug fixes, more features and better performance. Similarly, DriverMax (**www.drivermax.com**) will identify outdated drivers, then download and install updates.

23 FIX INTERNET EXPLORER 8

If IE8 seems very slow and unreliable then your upgrade from IE7 may have broken some DLL registrations. To fix this, open a command window (if you're running Vista, right-click 'cmd.exe' and select 'Run as Administrator') and type 'regsvr32.exe actxprxy.dll'. Press Enter, then reboot your PC to see if the browser has got any faster.

24 BLOCK FLASH APPLETS

Flash applets use up system resources and can slow down your browser. Often these applets take the form of unwanted adverts, so it's a good idea all round to block them and recover the resources to give improved performance. Firefox users need only install FlashBlock (**http://flashblock.mozdev.org**) to kill unwanted Flash apps, and if you install Adblock Plus (**www.tinyurl.com/2cd87q**) as well, annoying ads and banners will become a thing of the past. Meanwhile IE8 can now selectively block Flash applets, too. Click 'Tools > Manage add-ons', select 'Toolbars and extensions' and opt to show all add-ons. Double-click the Flash add-on and click 'Remove all sites > Close'. All Flash applets will now be blocked. However, if an applet is trying to run on a site you trust, click the warning bar, select 'Run add-on', add it to your allow list and Flash will be launched automatically on your next visit.

Clean up your iTunes library and options to see real performance benefits.

25 TWEAK MICROSOFT WORD

Simplify and speed up document displays by using a single typeface instead of many. To set this up, go to Word options, select 'Advanced', scroll to 'Show document control' and select 'Use draft font...'. If you're happy with your spelling, or at least content to check it when the document is done, turn off Word's AutoCorrect options (in the Proofing section of Options) to save some resources. If you have a fast printer then Word's default background printing can slow you down (Clear 'Print in background' in the Print section of Options). A corrupted or bulky 'normal.dotm' template may also negatively affect speeds. To sort this out, close Word, locate the 'normal.dotm' file in your profile and rename it 'normal.dotm.old'. You'll lose your custom settings, but it may help to speed up the application. If you find that this doesn't help, restore the previous normal.dotm to get your settings back.

26 CLEAN YOUR OUTLOOK INBOX

The more messages Outlook stores, the slower it gets, so if you want to improve performance then some pruning is in order. Most email responses contain copies of the original message, so you should be able to delete earlier messages without losing information. Thread Compressor (**www.threadcompressor.co.uk**) is a free Outlook add-in that will do this automatically. Save All Attachments (**www.netpro.biz/saveallattachmentsol2007.html**) will save all the attachments in multiple emails, and then remove them.

27 DISABLE ADD-ONS

Removing unwanted add-ons frees up system resources and can make your apps more stable. In Microsoft Word 2007, click the Word button, then click 'Word Options > Add-ins'. Choose the type of add-on you'd like to view in the Manage list, click 'View' and remove anything unnecessary. Repeat the process in Outlook 2007 by clicking 'Tools > Trust Center > Add-ins'. In Adobe Reader, click 'Help', select 'About Adobe plug-ins' and note the filename of anything you don't need. If you never want to save PDFs to RTF, say, then include 'SaveAsRTF.API'. Close Reader, go to the plug-ins folder — probably 'Program Files\Adobe\Reader 8.0\Reader\plug_ins' — and rename the unwanted plug-ins, for example changing 'SaveAsRTF.API' to 'SaveAsRTF.API.OLD'. EOC

DO THIS... STOP SHARING

Windows Media Player's media sharing functionality can be a real resource hog. To turn it off, right-click the Library tab, click on 'Media sharing' and clear the 'Find media' and 'Share my media' options. Next, launch 'services.msc', double-click Windows Media Player, click 'Stop' and set its Startup Type to 'Disabled' to save yourself some CPU time.

LINUX

Master multiple monitors

Don't limit yourself to using a single display. **Alex Dexter** shows you how to embrace a wider world.

WHAT YOU'LL NEED

A SECOND SCREEN

Whether you've got an old CRT laying unused, a television you want to connect your machine to or a brand-spanking-new 30in TFT, the process of attaching a second screen to your setup is the same.

THE LATEST GRAPHICS DRIVERS

NVIDIA and AMD update their drivers on an almost constant basis, and multiple monitor support is one of those things that can drop from one release only to reappear in another. In theory you're safest with the latest graphics drivers, but it may be worth hanging on to the previous release if you know that this will already work.

CRT AND VGA CABLES

Finding that old CRT is one thing, but you'll need to unearth the VGA cable as well if you want to do anything useful with it. If you've got a newer graphics card, then you may also need a DVI-to-VGA dongle.

Working with several displays instead of one can improve productivity, make watching films more practical and transform gaming into a far more immersive experience. Indeed, once you make the move to multiple displays, it's difficult to go back to a single screen. That's not to say that there aren't a few issues and foibles to overcome, but for 99 per cent of us, these are problems worth solving.

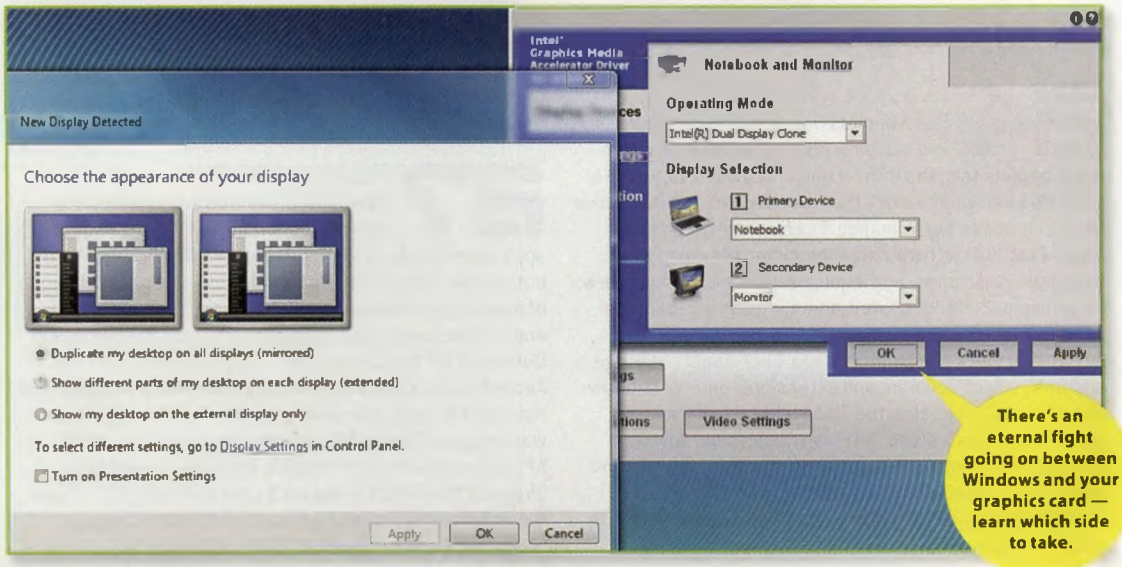
One of the best things about moving to a multiple screen environment is that you often don't need to invest in additional hardware to try it out. The shift from CRTs to TFTs means that most of us probably already have a perfectly good screen sitting around in a garage or shed just waiting to be used. If your existence is a little more clutter-free, you can pick up a perfectly good CRT for next to nothing, or even literally nothing if you're willing to scour **www.freecycle.org**.

The last piece in the puzzle is your graphics card. These have supported multiple outputs since before the introduction of the 3D graphics card, although the type of output has changed in line with tech fads. The latest cards tend to offer a pair of DVI connectors, with converters enabling an impressive array of display options. Even low-end cards from a few years ago tend to make use of the extra space available on the bracket to add an additional VGA output. At the very least you should find there's a TV-out option, which will enable you to get a taste for the multi-screen world, even if it's not the full desktop meal.

GETTING CONNECTED

A consideration for any multi-monitor setup is getting the physical connections right, or rather having the right cabling to actually do it. The venerable VGA D-Sub connector was the standard for CRTs, and it's still around today on cheaper TFT monitors. Even so, it isn't a great way of connecting to a TFT, as you're taking a digital signal and converting it first to analogue and then back again to digital inside the screen. If you're outputting to a pair of TFT LCDs then ideally you'll want to use DVI or HDMI on both so as to maintain the best image quality. Connecting a TFT to a VGA port never looks amazing, but it'll really get shown up if you sit the monitor next to a screen with a digital connection. This is more of an issue if your graphics card only offers a DVI and VGA connection. One option here is to make the jump to a dedicated graphics card for that second screen — one that offers a DVI connector or HDMI if necessary.

Once you've got your screens physically connected, getting Windows to work with them is fairly straightforward. Right-click the desktop, hit 'Properties' and then click on the 'Settings' tab to go to the relevant screen. You should see your second display greyed out. Select it, tick the option to 'Extend my Windows desktop onto this monitor' and hit 'Apply' to finish. You should find that your desktop wallpaper is stretched onto your new screen. That's it — you're ready to go.



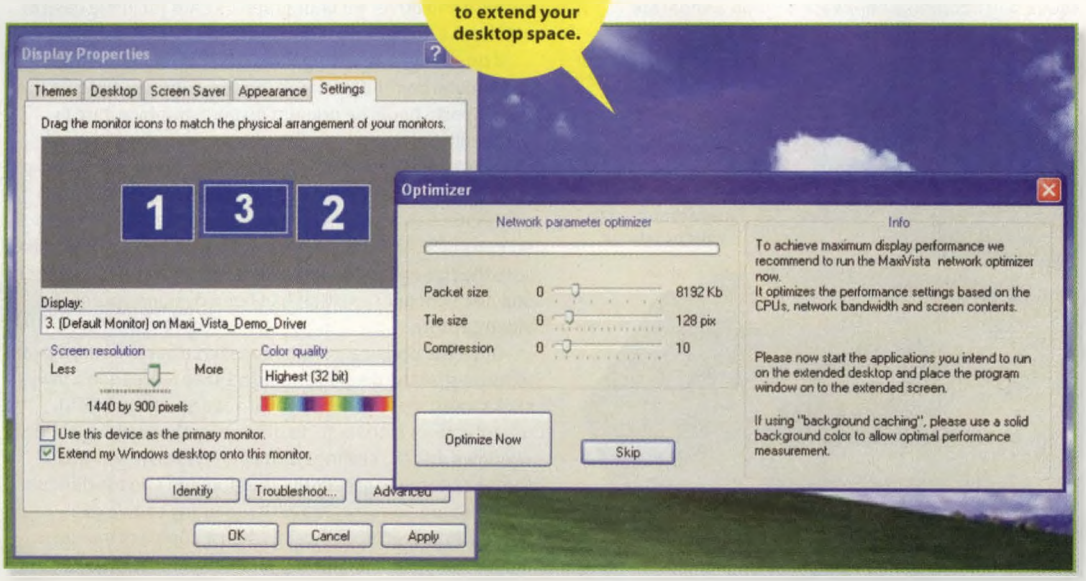
There's an eternal fight going on between Windows and your graphics card — learn which side to take.

One thing you may want to do at this stage is define how the screens are positioned in relation to each other. For two-screen displays this is typically side by side (Microsoft defaults to putting the new screen on the right), but you could have them on top of each other as well if you wanted. To move the screens around, simply drag the screen of choice to its new position and hit 'Apply'.

If you find merely extending your desktop to the new screen a little limiting for your needs, it's worth investigating the Advanced Properties for your graphics card. ATI, NVIDIA and Intel all go about multiple monitor support in different ways, but it generally involves wrestling the output options from Windows and dealing with them using the driver's own custom tools. This does add an extra layer of complexity, but it can offer improvements over the output. By way of example, the NVIDIA Control Panel supports Span mode, which glues both screens together and treats them as one physical resolution. Alternatively, it can clone your main display onto your second screen.

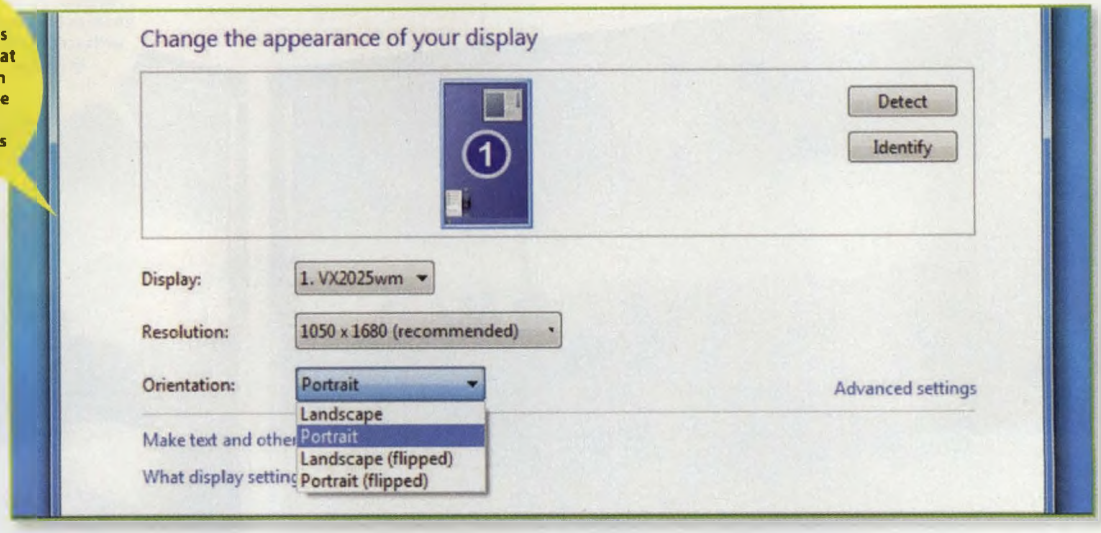
ADDING MORE SCREENS

Once you've made the move to adding one display to your setup, it shouldn't take a massive leap of imagination to realise that you can add even more. Microsoft supports up to 10 screens this way. Even so, you'll quickly hit physical connection issues that can only be overcome with additional hardware. In its simplest form, this can involve adding another graphics card,



DO THIS... SPAN, DUPLICATE OR EXTEND

Depending on your version of Windows, you may only be given the option of extending your desktop onto the additional screen. While this gives you more space to move around in and essentially view two different windows at once, there are limits to what such a configuration can do. You may be better served by electing to duplicate your main display on the second screen, or to treat the entire display as one large resolution. To do either, you're going to have to dig into your graphics driver's settings. NVIDIA, AMD and Intel all handle such options differently; it's merely a case of digging out the core settings. Controlling how these screens are orientated is a little clumsy compared to the Windows system, though (merely defined by a dropdown box with the screens in reverse order).



Windows 7 sees some changes made to the way that screen orientation and resolutions are set, but multi-monitor support is still standard.

SPOTLIGHT ON... GRAPHICS EXPANSION MODULES

Matrox — the one-time leader of the 2D graphics card market — has remodelled itself as a multi-display company with its DualHead2go and TripleHead2go boxes. These products take a single input and push it out to two or three screens respectively. Initially this was limited to analogue VGA signals, but the company now offers DVI spins on the same tech. Both boxes take a single input and produce a unified space across your screens.

One caveat of using a graphics expansion module (GXM) is each screen needs to be capable of rendering to the same resolution. Also, to use the digital version, you'll need to use a dual-link DVI-i connection (required by any display that supports resolutions above 1,920 x 1,200 at 60Hz).

A COMMON REASON TO USE MULTIPLE SCREENS IS PLAYING MEDIA

but it can also be achieved by using the likes of the Matrox TripleHead2Go or a USB solution from DisplayLink.

Adding a secondary graphics card was a lot more complex when AGP was the main interface for graphics cards, but the situation has improved substantially since the introduction of PCI Express and the success of multi-GPU graphics rendering. There are a lot more motherboards available with free PCI-E slots awaiting a fully featured second card. This is potentially overkill if all you want to do is drive an additional screen or two, though, where a single-lane PCI-E or PCI graphics card may suit you better. Both of these options come with a high price tag, though, so it's worth shopping around.

Another way of extending your desktop across multiple screens is to use the likes of MaxiVista, which doesn't require any additional hardware beyond a separate machine (an old unused laptop is an oft-cited example). MaxiVista works by sending screen information over your wired or wireless network to the second machine, and if that supports an additional display output, this can potentially give you four working screens very quickly. The software costs US$30 for basic screen extending, but a demo is available so that you can find out if it works for you before paying (**www.maxivista.com**).

TripleHead2Go is a great option if you want to attach more monitors to your notebook.

CONNECTING TO A TV

One of the most common reasons to use multiple screens is playing media. It's all very well watching top-quality HD content on your notebook, but to really make movies shine for the rest of the family you'll want to play them on a bigger screen. How easy it is to connect your machine to a big screen is defined both by the physical inputs supported by the TV, projector or HD display and also by the physical outputs and driver for your graphics card (or in the case of notebooks, the graphics subsystem).

If anything, outputting to an old TV is easier than going to a second computer screen, as some form of specific TV-out port should be present on your graphics card or notebook. Getting the signal onto a screen may require specific cables, though. S-Video tends to be the de facto standard for most graphics card manufacturers, but in some cases the preferred input on standard-definition screens is SCART, a tricky format for PCs. You need to make sure that you get a converter that is fully wired for output, and not a cheaper one that has been designed purely for video capture.

Once the physical connections have been made, the job of turning on the display should be little more than a few clicks away. For TV output you'll need to use your GPU manufacturer's driver to do this rather than relying on the Windows display settings, but apart from a few tweaks that we'll come to presently, this shouldn't be too difficult.

There are some issues with rendering to an extra screen, however, specifically when it comes to movies. Most media players will only render to the main screen

when you try playing back a movie in full-screen mode. This can be incredibly frustrating, especially if you're trying to play back movies from a notebook. You could solve this by making the TV screen your setup's main display, but even this may not always work when you go full-screen.

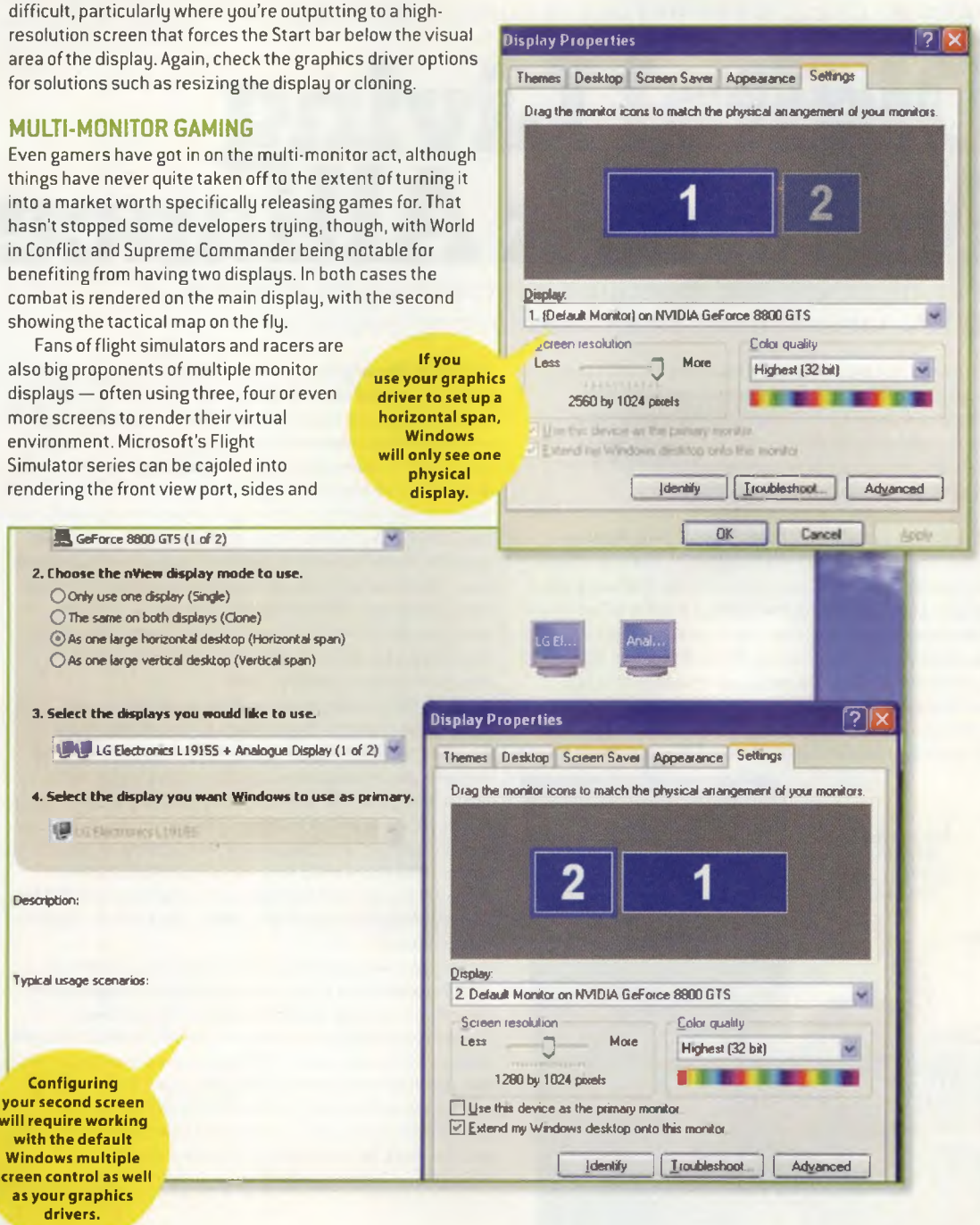
The workaround is to configure the TV display as the only screen that the system uses by turning off the laptop display. This is the antithesis of configuring multi-monitor setups, but it's an option that does produce a workable output. It can introduce problems of its own though, especially if the machine feeding the TV is a long way from the display (potentially in another room). On a lesser level, even accessing the components of your computer can be difficult, particularly where you're outputting to a high-resolution screen that forces the Start bar below the visual area of the display. Again, check the graphics driver options for solutions such as resizing the display or cloning.

MULTI-MONITOR GAMING

Even gamers have got in on the multi-monitor act, although things have never quite taken off to the extent of turning it into a market worth specifically releasing games for. That hasn't stopped some developers trying, though, with World in Conflict and Supreme Commander being notable for benefiting from having two displays. In both cases the combat is rendered on the main display, with the second showing the tactical map on the fly.

Fans of flight simulators and racers are also big proponents of multiple monitor displays — often using three, four or even more screens to render their virtual environment. Microsoft's Flight Simulator series can be cajoled into rendering the front view port, sides and more. Indeed, it's fairly straightforward to work this trick in just about any 3D game — it's merely a case of extending the viewport, or rendering it at slightly different angles. It does require significantly more raw rendering power to do this, though, and costs can quickly hit enthusiast levels.

Gaming on multiple displays needn't be so grand, though. Players of Eve and the ubiquitous World of Warcraft can benefit from multiple displays, running the games on one screen so that information found on web sites and forums can be viewed alongside the gaming world. It's the perfect solution for a piece of serious meta-gaming, and takes advantage of a game's ability to render in a movable window.



MORE ABOUT... SLI AND CROSSFIRE

Both NVIDIA and AMD have managed surprising success with the gaming-focused SLI and CrossFire dual-graphics solutions, but when it comes to multiple monitor support, things are less impressive. Both solutions are only capable of rendering to a single screen for dual-card acceleration, and until recently, turning on SLI would blank the other screens connected to a system. The latest drivers have supposedly fixed this, however. The bottom line is that a powerful single card better serves gamers looking for multiple monitor support.

TIP... USING INTEGRATED GRAPHICS

If your motherboard boasts integrated graphics, then there's a chance that you can use the output from that to drive an additional display. You'll need to make sure that the BIOS isn't configured to automatically turn off the integrated graphics if a discrete card is present, but providing that you've got a reasonably up-to-date machine, this shouldn't really be a problem. Limitations of the AGP interface mean that boards of that era won't enable you to use both together, but anything newer than that should be fine.

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APC EXPERT

THE CONNECTED GUY

David Neiger is building the connected house in a real home and will be filing regular columns as he goes along. David is a qualified engineer with many years of networking, IT implementation, consulting and project management experience.

WHAT'S NEXT?

PART 10

OCTOBER '09 STREAMING MUSIC

PART 9 CREATE THE ULTIMATE CONNECTED HOME

Digital Living Network Alliance

One important and emerging interoperability standard is DNLA, which shows much networking potential.

Last month we talked about how to connect an Xbox to your home theatre system to use as a media extender with Windows Vista and Media Center. Despite some limitations (many of which will be overcome in Windows 7), this system works reasonably well provided you are happy to live with the few devices that support Windows Media.

Far more flexible solutions, at least in terms of the number of appliances available, are DLNA (Digital Living Network Alliance) or Universal Plug and Play (UPnP). The Digital Living Network Alliance is an industry group of over 250 companies (including Sony, Samsung, Panasonic, LG and Acer) who have agreed to work together to develop a set of interoperability standards to allow digital devices to work together. What this means is that, in theory anyway, you should be able to effortlessly stream audio, video and images between any DLNA-certified device that supports the same categories of digital content (audio, images or video). A visit to the DLNA web site (**www.dlna.org**) will outline the vision, although you can easily get bogged down in the acronyms.

Without getting too technical, DLNA uses your existing wireless or wired network to transfer data between devices using the IP networking protocol. A DLNA device can either act as a server that transmits digital content or a client that receives digital content. An example of each would be a PC that sends music files (server) to a Giga Juke music system that plays the music (client). For most people this is sufficient info to be able to connect and use DLNA devices. Where things get confusing is the DLNA terminology, with similar-sounding acronyms for different classes of device. Every DLNA device must support at least one class of functionality, although many devices are multifunctional.

Using DLNA terminology, what we would call content servers, are known as Digital Media Servers (DMS). This is where data is stored and transferred to other devices. There are two types of what we would call clients: a Digital Media Player (DMP) or a Digital Media Renderer (DMR). A Digital Media Player accesses the server directly (via on-screen menus) to play the content, whereas a Digital Media Renderer plays content that is streamed to it. The key difference between these devices is that a Digital Media Renderer is controlled by a Digital Media Controller (DMC), while a Digital Media Player is self-contained.

To give an example of each, a Sony Bravia television is a DMP, because it can access photos and music stored on a PC directly. An example of a DMR would be a set of remote speakers that plays music streamed to it from a music system such as a Sony Giga Juke. If the music is coming directly from the Giga Juke it would be the DMS, although if it is accessing music stored elsewhere (such as from a PC) it would be the DMC. Whilst not strictly home entertainment devices, printers can also be DLNA-enabled and, if they are, they are called Digital Media Printers (DMPr).

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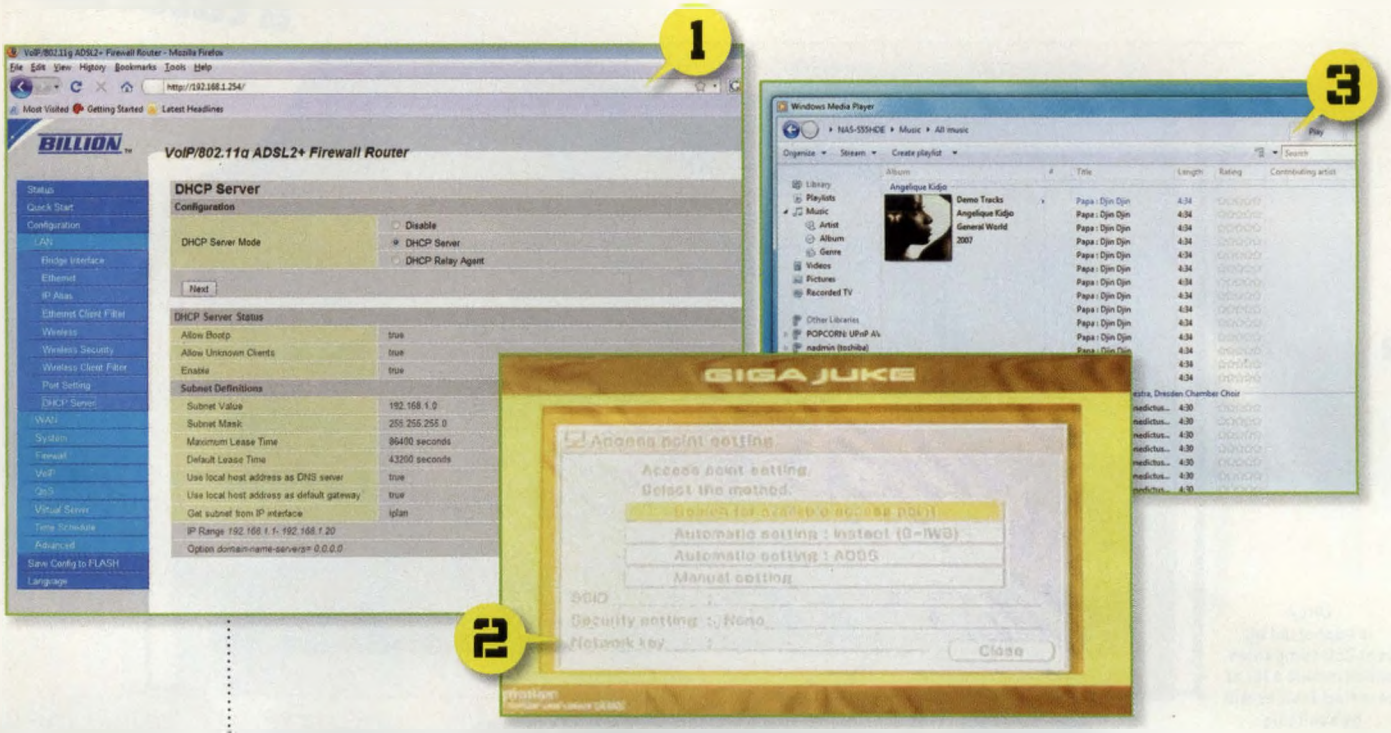
DNLA is supported by over 250 companies, which means a lot of certified devices will be available.

There is also a whole range of mobile devices that can be DLNA-enabled (although finding them in the shops is still a little difficult). These include Mobile Digital Media Servers (M-DMS), which include mobile phones that can send photos to the network. Mobile Digital Media Players (M-DMP) are devices that can play digital content from the network. Mobile Digital Uploaders (M-DMU) are devices such as cameras that send content to the server, whereas Mobile Digital Downloaders (M-DMD) are devices such as portable music players that download music from the server. Sometimes you might want to control a Digital Media Renderer with a handheld device (such as a DLNA remote control). These devices are known as Mobile Digital Media Controllers (M-DMC).

Then there are classes of devices that make the equipment work together, such as Mobile Network Connectivity Function (M-NCF) devices that act as an interface between mobile devices and the network and Media Interoperability Units (MIU) that convert data into a format suitable for mobile devices, such as an appliance that converts MPEG-2 video into 3GPP files for viewing on your phone. That is the vision, but, as is common in the technology world, the reality is often a few steps behind.

In the Connected Home we have gathered several DLNA devices that you can purchase at white goods retailers such as the Sony Bravia TV, a PlayStation 3 (PS3), a Sony Giga Juke music system and a Nokia N96 mobile phone. We will also use a Popcorn Hour Network Media Tank from the Labs, which we reviewed last year. Unfortunately, we could not readily source examples of Digital Media Controllers or Mobile Digital Uploaders, although we understand that some models of Sony Cyber-shot cameras (which are available overseas) do have that functionality. Since most people do not have access to a Vaio notebook (DLNA-certified) or DLNA



DO THIS... RESEARCH & UPGRADE

Doing a Google search revealed that other PS3 users have also encountered the PS3 problems we had, but we were unable to find the cause or possible solutions. Thankfully, we didn't have this problem streaming media from our PCs and were able to enjoy MPEG-2 video, WMV (VC-1) high definition content and MP3 music. When we upgrade to Windows 7, even more file formats will be supported.

certified network attached storage devices, we will connect our DLNA devices to ordinary PCs running Vista Ultimate and Windows 7 RC.

In theory, all we should need to do is configure our network correctly and the DLNA devices will happily communicate with each other to share content. Of course, there is a little more to do than that, although we do believe that, in the future, as DLNA standards and devices mature, connectivity and interoperability will become easier. Unfortunately, since our *APC* Crystal Ball blue-screened on us, we don't know when that will happen.

Since the whole aim of DLNA appliances is to have them easily connect to the network, it is important that your network is configured correctly. You must enable DHCP on your router to ensure that the DLNA can obtain an IP address and set the default gateway (the IP address of the router) and DNS servers (again usually the router). Most routers enable DHCP by default but it is important to check. If you will be connecting many devices you need to ensure that the DHCP address range (scope) is sufficient.

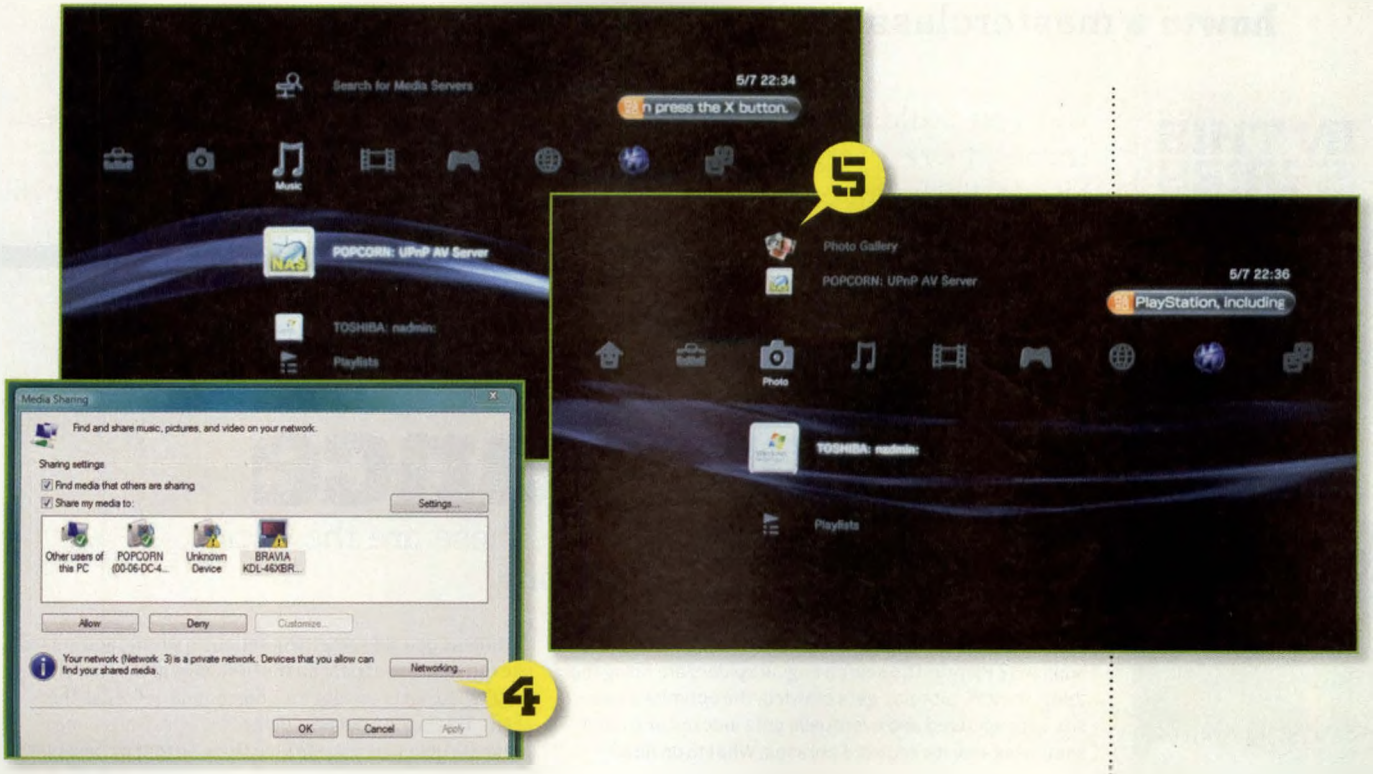
1 Each router is different but you usually enable the DHCP server from the LAN configuration tab. Depending on the model of your router, you may have to go to the advanced tab or enable advanced settings.

If you are planning on connecting wireless DLNA devices (such as the Nokia N96 mobile) you need to ensure that wireless is enabled on your router and you have set a secure (ie. not easily guessed) network key. Don't leave this field blank, or use an obvious key, unless you want to share your internet connection with the neighbourhood. It is important that you enable WPA or WPA2 encryption to prevent your network from being compromised. However, this is where you could run into problems, because some DLNA devices (such as the Giga Juke) do not support WPA encryption. Faced with this choice, you either need to risk opening up your network to eavesdropping and attack by using WEP encryption or use less secure devices with a wired connection only.

The other thing you will need are some network switches, particularly in the home theatre room, where you will be connecting many devices. An 8-port network switch such as the Linksys EZXS88W will allow you to split the Ethernet connection from the wall amongst seven devices. If you have configured your network correctly, connecting the Bravia television is a simple matter of plugging one end of the network cable into the network port on the back of the Bravia and the other end into your network switch. To access content, simply press the home button on the remote control and select the Music or Photo option. Note that the current models of Bravia televisions cannot stream video from PCs. If your PC has been set up correctly (more details on this later) you should be able to select it from the Bravia menu and access content from it.

2 Connecting the Giga Juke is also straightforward using a wired network connection. Simply plug one end of the cable into the Giga Juke and the other end into the network switch and select wired configuration from the menu. The trouble in our case is that we wanted to install the Giga Juke in the family room and use a wireless connection. Unfortunately, the Giga Juke cannot even see the wireless network if we use secure WPA encryption, so for testing we had to open our network or use easily defeated WEP encryption. We hope our neighbours are trustworthy!

To use wireless networking, we plugged the supplied wireless network stick into the read USB port of the Giga Juke, selected wireless network from the menu and allowed the Giga Juke to configure itself. We entered the WEP passcode for the Giga Juke to be able to connect to the network. Once connected it was easy to access the music stored on the Giga Juke hard disk from the Bravia television. As well as acting as a media server, the Giga Juke can also act as a media player, easily accessing music stored on our PC and the hard disk of our Popcorn Hour Networked Media Tank. Setting up the PCs to act as Digital Media Servers is generally a straightforward exercise. In fact if you have set up your PC to stream music to the Xbox it is ready to work



with DLNA devices, since Vista Home Premium and Vista Ultimate include support for UPnP or DLNA devices.

3 If your PC runs Windows XP or Vista Home Basic you will need to install Windows Media Player 11, which you can download from the Microsoft web site. Make sure you run Live Update (and have SP3 installed for XP or SP2 installed for Vista) to patch security vulnerabilities. Install Windows Media Player 11 and create a directory where you will store all of your music and photos. Media Player can search your hard drive for music and photos, but if you have it organised in the one folder it will be quicker for MP to index.

4 Open Media Player and select 'Library > Media Sharing'. You will be presented with a box showing all of the devices that can stream media from your PC including the Giga Juke, Bravia television and in our case the Popcorn Hour. Enable sharing and click OK. That's all you need to do to enable media streaming from your PC. The difficulty is if you want to be able to stream music from your devices back to your PC. Whilst this may not be an issue if all of your devices are Digital Media Players (such as the Bravia television), it can be a problem if you store some of your music on other devices such as the Nokia N96 phone, which allows you to download music from the internet. Whilst Media Player 11 under Vista is supposed to be able to work as a DLNA client, we were unable to do so (although you may be able to access the content on some devices using network shares).

The good news is that Media Player 12, which is included with Windows 7, is fully DLNA-compliant which means that you can access content on your Giga Juke, Nokia N96 or other DLNA device directly. Each device appears as its own library in the navigation pane on the right of the screen, making it easy to stream music to and from your PC.

The Nokia was one of the easier DLNA devices to set up, although we found that performance over our wireless network (which runs 802.11g) was patchy at best. Nokia Europe has created a little Quicktime video tutorial in which Christina shows you exactly how to setup the N95 (which is identical to our N96). The video, which can be found at **http://tinyurl.com/knfu5y** is definitely worth watching.

Simply go to the 'Tools' menu, select 'Connectivity', select the home media icon (the one with the picture of the home). Select to share your content and connect to your wireless LAN. Once this has been done, your phone becomes visible on DLNA devices such as the Bravia television and PS3, and if you are patient, you can stream photos and music directly from your phone. Connecting up a PS3 to use a media player should be a straightforward exercise. In the Connected Home we decided to use a wired connection, as it will give better performance. It is possible to safely use a wireless connection as well, since the PS3 supports WPA/WPA2 encryption, although you will need at least 802.11g and preferably 802.11n (draft) for reasonable video streaming.

5 Setting up the PS3 is easy. In the Connected Home we used HDMI, since both our Yamaha Surround sound system and Sony Bravia TV support HDMI. HDMI gives us full multi-channel surround sound and 1080p pictures. If your television doesn't support HDMI, you can still use the PS3 with component and optical audio outputs, although you will not get full 1080p resolution when playing back Blu-ray discs due to digital rights management restrictions.

The PS3 was able to connect to using the 'Easy' settings because we had already preconfigured our network with DHCP. If you are using a wireless connection, all you need to do is select the network and enter the WPA key.Then you can browse for other DLNA devices on the network from the video, music and photo menus. If you want to share content from your PC, you will need to enable sharing with the Unknown Device that appears in Media Player, since the PS3 does not correctly identify itself to the PC.

DLNA as a technology shows great promise but it is still immature. Devices don't always work as expected and sometimes content playback, particularly with video can be hit or miss. We haven't found home entertainment nirvana with DLNA just yet, but we'll check back in a few years once standards have matured.

MORE ABOUT

AN EVOLVING STANDARD

Remember that we said that DLNA is an evolving standard, which means that things might not work as well as expected just yet. In our situation, the PS3 was able to find the Popcorn Hour device, which it identified as a NAS (network storage device). We were able to access MP3 music, JPEG photos and MPEG-2 video which we had on the hard disk, but for some reason the PS3 kept on identifying a DLNA Protocol Error 2101 when connecting to the Popcorn Hour, but the media would still play. The obvious solution in this case is to upgrade the firmware of all devices. From the PS3 we went to the settings menu and chose the system upgrade option. We also upgraded the firmware on our Popcorn Hour device. Unfortunately, in this case it did not resolve the issues, and whilst the PS3 works, we keep getting these meaningless Protocol Error messages on the screen.

IN THIS SERIES

Did you build a web site and nobody came? Ash Nallawalla walks you through everything you need to know in order to optimise your web site for search engines so as to generate traffic and get hits on your site.

APC EXPERT

ASH NALLAWALLA

Ash manages natural and paid search traffic for some of Australia's largest web sites. He is an internationally acknowledged expert in search marketing, and he previously operated an SEO training business. Recently, he presented two sessions at the WebmasterWorld Conference in Las Vegas, which he has written up at his blog **www.netmagellan.com**. Ash can be contacted at **ash@crm911.com**.

WHAT'S NEXT?

OCTOBER '09 WEB ANALYTICS AND MORE

FINAL CLASS SEARCH ENGINE OPTIMISATION

Maintenance

Once you've optimised your site, these are the tricks to ensure you maintain its ranking.

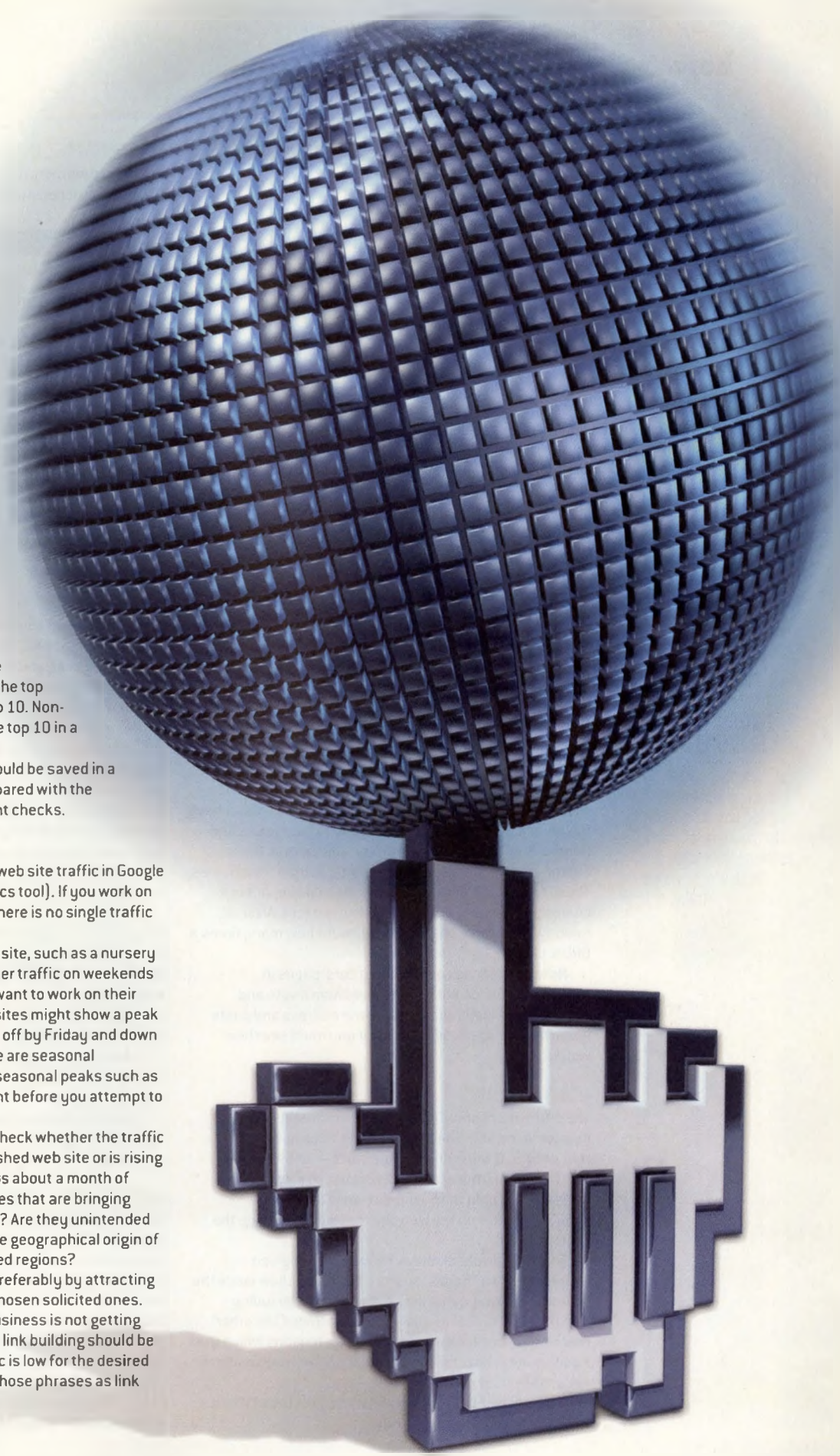
Once you have done the basic implementation tasks, what happens? Plenty! The search engine spiders are doing their thing; the XML sitemap gets crawled; the optimised web site gets spidered and eventually gets indexed and ranks somewhere for its keyword phrases. What to do now?

POSITION CHECKING

Let's get one thing straight. Checking positions (ranks) of your valuable keyphrases is still important, but these days the main success indicator is the quality of traffic. It might be higher, or it might be lower, but it will be better targeted than before.

Unless you did something seriously wrong, you should see the web site appear on the first page of the search results. Do not break out the champagne yet or call the client. This is the brief time in the limelight, while Google presents your new page to searchers so that it can assess how many clicks were gained. Then it chucks it at the back until it rearranges the ranks for that particular search term.

A few weeks later, you should search for all the desired keyphrases in the major search engines and see if the site appears at all and whether it appears in the top 30 results. This presumes that the site is not in a highly competitive industry, such as finance or travel, where a high ranking



will require a lot of content-writing and linking.

If it is not in the top 100, then don't spend too much time investigating until a month has passed. Except for extremely competitive industries, a few of the keyphrases will begin to appear in the top 100 and slowly rise towards the top 10. Non-competitive terms should reach the top 10 in a month and sometimes a little later.

These ranking observations should be saved in a database or spreadsheet and compared with the benchmark ranking and subsequent checks.

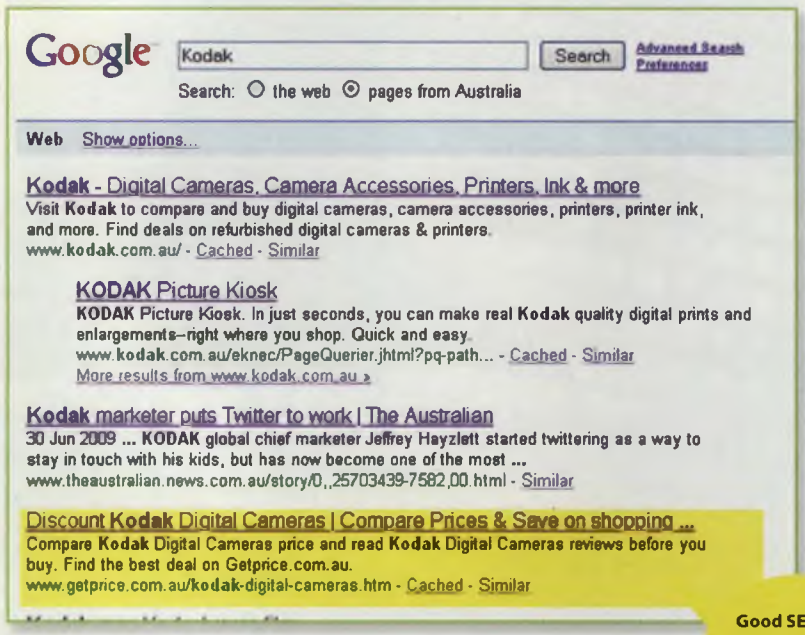
CHECKING TRAFFIC

It is more interesting checking the web site traffic in Google Analytics (or an alternative statistics tool). If you work on many sites, you will discover that there is no single traffic pattern that covers all sites.

A home improvements-themed site, such as a nursery or hardware store, might show higher traffic on weekends because that's when most people want to work on their renovations. Most small business sites might show a peak on Mondays and a gradual tapering off by Friday and down by two-thirds in the weekend. There are seasonal industries such as ski resorts and seasonal peaks such as florists. This knowledge is important before you attempt to read too much into the statistics.

For the time being, you should check whether the traffic pattern has changed for an established web site or is rising steadily for a new site. When there is about a month of traffic you can check the keyphrases that are bringing visitors. Are these new and desired? Are they unintended keyphrases? You can also check the geographical origin of the visits. Are they from the intended regions?

Link building should continue, preferably by attracting unsolicited links or very carefully chosen solicited ones. For example, if an Australia-wide business is not getting the anticipated traffic from a state, link building should be concentrated on that state. If traffic is low for the desired keyphrases, then you have to use those phrases as link anchor text.


Google
Kodak
Search
Advanced Search
Preferences
Search: the web pages from Australia
Web Show options...
Kodak - Digital Cameras, Camera Accessories, Printers, Ink & more
Visit Kodak to compare and buy digital cameras, camera accessories, printers, printer ink, and more. Find deals on refurbished digital cameras & printers.
www.kodak.com.au/ - Cached - Similar
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KODAK Picture Kiosk. In just seconds, you can make real Kodak quality digital prints and enlargements–right where you shop. Quick and easy.
www.kodak.com.au/eknec/PageQuerier.jhtml?pq-path... - Cached - Similar
More results from www.kodak.com.au »
Kodak marketer puts Twitter to work | The Australian
30 Jun 2009 ... KODAK global chief marketer Jeffrey Hayzlett started twittering as a way to stay in touch with his kids, but has now become one of the most ...
www.theaustralian.news.com.au/story/0,,25703439-7582,00.html - Similar
Discount Kodak Digital Cameras | Compare Prices & Save on shopping ...
Compare Kodak Digital Cameras price and read Kodak Digital Cameras reviews before you buy. Find the best deal on Getprice.com.au.
www.getprice.com.au/kodak-digital-cameras.htm - Cached - Similar

Good SEO can only get you so far in the ranking list. Sales are up to the site owner's offers.

HITTING THE LINK WALL

Linking is a journey, not a discrete task. There are four stages in a successful link-building campaign:

	Stage	Actions
1	Sitemap submission, initial links and indexing – one or two days.	You have to get your site indexed, so you should get links from sites that Googlebot likes to visit often, such as those with PR4 or more.
2	Quality linking – takes at least one month.	Getting links from high TrustRank sites, including independent news media outlets, well-known portals or blogs, and authority sites in the industry. Don't worry about the PageRank of them.
3	Basic linking – six to twelve months.	Get a volume of links from relevant sites, regardless of their PR value. You have to match or exceed the number of links that competitors have. After an initial burst, your success rate will level out.
4	Link saturation.	Ranking is achieved at this point and its timing depends on the competitiveness of your niche. When all your pages are indexed and maximum internal and external linkage is achieved. There's no upper limit to natural links.

Small business sites find it difficult to get quality links. There is a temptation to get links of any kind, and there are novice SEO companies waiting to submit your links to worthless directories (or worthless submissions to quality directories).

The trick is not to succumb to desperation when ranking does not improve. The effort is better spent thinking about ways to get natural links — from articles about your web site in magazines, from industry associations etc. Rather than think about the web site itself, think about making the business better, that is, more newsworthy. Sponsor some local events, run a competition that runs for three months, put some funny video of the CEO in a charity event etc. The links will come.

AVOIDING PLAGIARISTS

If your web site has great content, it might be copied in full or in part ("scraped") by others who usually want to place AdSense on it. There is a temptation to ignore such situations, but there are two main consequences for the SEO who does nothing:

- A duplicated page (such as a copyright violation) runs the risk that the search engine might consider the original page as the duplicate and demote its ranking.
- Other sneaky ways of fooling the search engine algorithms might give the searcher a bad experience and encourage SEOs to do the same.

REPORTING A COPYRIGHT VIOLATION

Before spending money on legal measures, which won't work when the perpetrator is not traceable, check the Digital Millennium Copyright Act. It applies to Americans, but since the main search engines are in the US, you can use this Act. This is the best way to get the plagiarised sites out of Google. An edited version of your complaint is also submitted by Google to Chilling Effects (**www.chillingeffects.org**) for the world to see. Other copyright complaint URLs are: **www.google.com/dmca.html**; **http://info.yahoo.com/copyright/us/details.html**; **www.microsoft.com/info/cpyrtInfrg.htm**.

MORE ABOUT... MONTHLY REVIEWS

A monthly review with the web site owner is a good time to discuss forthcoming changes to the content, changes in rankings, visitor traffic etc.

"HUMAN-ASSISTED" RANKING

Every time you check a keyphrase manually in Google and find the target site in the results, you should click the result — only if it's your own site, then do it once a day. If you visit other premises, say, a friend's home or a branch office (different IP address), you should run the same search there and click the results. If you are an SEO bureau, you will not have the time to do this, as there will be many customers and hundreds of keyphrases. However, you can ask the customer to request their staff to do this from their homes. These few clicks will not make a noticeable impact in a competitive sector, but will help with the rest. After all, ranking algorithms do take into account how many times a URL is clicked.

Note: Do *not* click your competitors' pages in the results! You do not want to give them a vote and thus improve their ranking. Copy the address and paste it into the browser's address bar if you must see their web site.

CONVERSIONS

The site owner should check the site statistics, but so should the SEO. The customer will often assume that good SEO will result in more sales — in fact, good SEO will deliver more targeted visitors, so sales will increase, but only the business owner can make a compelling offer on the web site that will encourage the visitor to buy.

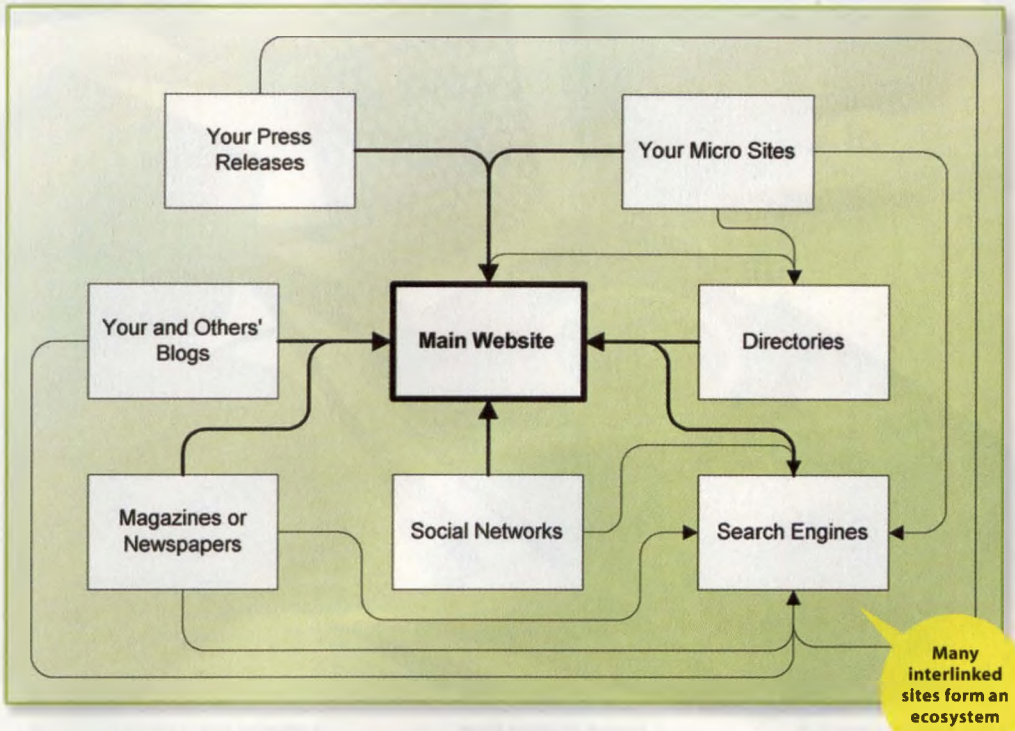
The SEO can check the landing pages for given keyphrases. If a "Kodak" search result somehow lands the searcher on a page that lists many brands, including Kodak, it is not ideal for the business owner if the other brands deliver a lower margin. Look for reasons why a true Kodak page is not showing for such a search and make the necessary changes to the page.

Helping the business owner to interpret the statistics will help the SEO in the long run.

Web 2.0 and the power of little things

WEB SITE ECOSYSTEM

Think of every web site as being in an ecosystem, even if there is initially only one site. A mature SEO ecosystem includes all the sites owned by the customer and, more importantly, other sites that link to the customer's site. In earlier lessons we covered directories, blogs and social media. We will now look at some other resources that can help.



MICRO SITES

One-page sites (or sites with less than five pages) are known as micro sites. They are not a primary web site but they support the latter. For example, a car manufacturer such as General Motors Holden might have a primary web site, but they could build a micro site for each of its product families, eg. Commodore, Hummer and Saab. Micro sites can also rank well in many cases (31% ranked in the Top 20 according to my research) but their main value is to give very targeted, deep links to the primary web site.

FREE MICRO SITES

Any free site whose pages appear to be indexed by the major search engines (provided someone links to them — but do not link to them from your own collection of web sites!) are likely to be good candidates. Examples:

- A blog at **blogspot.com** or **wordpress.com**.
- **Aboutus.org** — a Wiki that enables you to create a page about your site.

You can have "paid" micro sites — ones that cost you money to obtain, but the same principle applies: try not to link to them from any of your own sites. Get external links to them. As separate web sites in their own right, you have to perform SEO on them too.

Micro sites are also used by domain name speculators (known as "domainers") to place PPC ads for display to type-in traffic. There is little textual content in the templates of such sites, so only the least competitive keyphrases will rank in the organic search results.

PRESS RELEASES

There are many paid and free press release services. From the SEO perspective, the press releases themselves provide little ranking benefit, but most of them provide links. They should be considered primarily a marketing tool, and you must write something newsworthy.

LIST OF FREE AND CHEAP PRESS RELEASE SERVICES

- 1888 PressRelease.com: **www.1888pressrelease.com/**
- 24-7PressRelease.com: **www.24-7pressrelease.com/**
- EcommWire: **http://ecommwire.com/**
- Express Press Release: **http://express-press-release.com/submit-press-release.php**
- Free News Release: **www.free-news-release.com/**
- Free Press Release Center: **www.free-press-release-center.info/**
- FreePressRelease: **www.free-press-release.com/**
- I-Newswire.com: **http://i-newswire.com/**
- India PRwire: **www.indiaprwire.com**
- Malebits: **www.malebits.com/**
- Media Press Release: **www.media-press-release.com/**
- MediaSyndicate: **www.mediasyndicate.com/**
- PowerHomeBiz: **www.powerhomebiz.com/BizNews/pressrelease.htm**
- PR.com: **www.pr.com/**
- PR Leap: **www.prleap.com/**
- PR Newswire: **www.prnewswire.com/**
- PR9: **www.pr9.net/**
- PressExposure: **http://pressexposure.com/**
- Pressmethod: **www.pressmethod.com**
- PRLog: **www.prlog.org/**
- PRweb: **www.prweb.com/**
- PRZoom: **www.przoom.com/**
- The Open Press: **http://theopenpress.com/**

AFTER SEO
WEB ANALYTICS AND MORE

This is it for the SEO Masterclass – but Ash Nallawalla will continue with his masterful coverage of professional web topics. Next month, he looks at web analytics.

110 downtime

HIGH-PERFORMANCE PLAYTIME

01 iRIVER E100 MP3 PLAYER

The iRiver E100A is a very good alternative to the market-saturating iPod. It's a feature-packed MP3 player that has brought together all your multimedia needs into a single unit, featuring intuitive controls and easy-to-use functions. Videos can be displayed on its large 2.4in LCD screen, while the new SRS WOW HD sound field technology reproduces good, clear sound. A built-in voice recorder, the ability to record music and an FM tuner are functions that you'd usually pay extra for. When you pair that with the ability of expanding the unit's memory via a Micro SD card slot, you can see why the E100 is a very popular unit.

CONTACT	iRiver
ONLINE	www.iriver.com.au
PRICE	$159

02 STAR TREK USB SKYPE PHONE

New to the market is the original series *Star Trek* USB Communicator Internet Phone that works with VoIP services like iChat, Skype, MSN and AIM. This blast from the past comes loaded with 21 different sound effects and a moire LCD screen that spins and even makes the chirping sound when you flip it open. The communicator is a simple USB plug-and-play unit that is equipped with volume controls and a mute button. This is no plastic fantastic either; the body is solid and the cover is made up of real metal mesh so you don't have to worry about it falling apart in your hands the first time you try to use it. A must for any Trekker.

CONTACT	Think Geek
ONLINE	www.thinkgeek.com
PRICE	$44

03 PS3 BLUETOOTH HEADSET

The popularity of voice commands in games has prompted Sony to release its own 'official' Bluetooth headset for the PS3. Boasting "High-Quality (HQ) mode", the headset will take advantage of advanced voice technologies and noise-cancellation techniques to provide clear and wideband voice input to the PS3, including making voice commands more reliable. The PS3 will display an in-game status indicator that will show the headset's connection status, battery charge level, speaker volume level and microphone mute status. As a bonus, when the headset is docked in the charging cradle, it works as a desktop microphone.

CONTACT	Sony
ONLINE	www.sony.com.au
PRICE	$74.95

04 LOGITECH FLIGHT SYSTEM G940

For flight simulation enthusiasts who love to take to the skies for combat missions or for the simple thrill of piloting aircraft in artificial 3D environments, the Logitech Flight System G940 provides a truly realistic experience. Combining force feedback with authentic controls inspired by military and commercial airplanes and helicopters, the Flight System G940 works and feels like the real thing — from take-off to landing. The three-component Logitech Flight System G940 features a force feedback joystick, dual-throttle and rudder pedals. The Flight System G940 is compatible with most popular PC flight simulators.

CONTACT	Logitech
ONLINE	www.logitech.com
PRICE	US$299

05 SILVERLIT R/C SKYBOT ATTACK

Robots are cool... but flying robots that shoot lasers out of their chests are freakin' awesome! The Skybot Attack features two radio-controlled robots with twirling twin rotors on their shoulders that allow for somewhat controlled flight. They take a bit of mastering but, once airborne, you can set about trying to shoot each other down using an infra-red laser on the robot's chests. You can get into anime-styled dogfights as you try and shoot your opponent out of the sky to the soundtrack of cheesy Japanese action music. Making a hit on an enemy robot switches it off, causing it to fall from the sky in a simulated death plunge.

- CONTACT Silverlit
- ONLINE www.play-asia.com
- PRICE $74.38 per pair

06 WIRELESS MOBILE MOUSE 6000

One of three new peripherals from Microsoft (including the Wireless Desktop 3000, right), the Wireless Mobile Mouse 6000 is the first mouse to use Microsoft's nano transceiver: a dongle that can easily be left in your USNB port, as it it only protrudes by 8mm. Or, if needed, it can be stored conveniently right in the underside of the mouse. The Wireless Mobile Mouse 6000 features a sleek, ambidextrous design with chrome accents. The 6000 has a 2.4GHz navigator that's effective up to a range of 30 feet from the PC and functions on almost all surfaces. At less than a hundred dollars it is a good-quality piece of kit at a reasonable price.

- CONTACT Microsoft
- ONLINE www.microsoft.com.au
- PRICE $89.95

07 WIRELESS DESKTOP SET

This is the first desktop set to come with a mouse featuring Microsoft's BlueTrack Technology. The Wireless Desktop 3000 can be be paired with the Wireless Mouse 5000, with reliable 2.4 GHz wireless technology and a plug-and-play mini-transceiver. The keyboard features quiet-touch keys, a thin-profile design and a soft-touch palm rest. Media controls allow you to easily navigate to the next or previous track, as well as play, pause and control volume, while hotkeys make internet access a one-button process. Enhanced F-Key Functionality simplifies the process of opening documents, replying to e-mails and toggling between F-key commands.

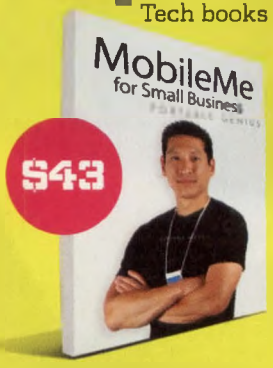
- CONTACT Microsoft
- ONLINE www.microsoft.com.au
- PRICE $129.95

08 PLANTRONICS GAMECOM 777

Experience the thrill and excitement of 5.1 Dolby Surround Sound the next time you're up to your armpits in gaming heaven with the GameCom 777 Stereo PC Headset. Designed specifically for gamers who demand top-level sound performance (and who wouldn't?), the GameCom 777 enhances any gaming experience with its surround sound, powerful 40 mm speakers and hidden mic boom with built-in noise-cancelling microphone. Unlike some other models, you can actually differentiate sound directions with the Gamecom. An open-ear design makes it a very comfortable and very appealing addition to your gaming arsenal.

- CONTACT Plantronics
- ONLINE www.plantronics.com
- PRICE $149

Inprint
Tech books



$43

MOBILEME FOR SMALL BUSINESS
www.wiley.com

Apple's new internet service allows small businesses to push email, contacts and calendar information to iPhones, iPod touches, Macs and PCs via Apple's secure online server or 'cloud'. Companies seeking the mobility of cloud computing with MobileMe can find out what they need to know in this handy guide, packed with tips and techniques.

$50

SOCIAL MEDIA MARKETING AN HOUR A DAY
www.wiley.com

If the idea of starting a social media marketing campaign overwhelms you, this book will introduce you to the basics, demonstrate how to manage details and describe how you can track results. Case studies, step-by-step guides, checklists, quizzes and hands-on tutorials will help you execute a social media marketing campaign in just one hour a day.

Power Monkey Explorer

GOING GREEN
Charge your gadgets guilt-free as you save the world from those evil greenhouse gases, while saving yourself money.

$150

9/10

Power Traveller enables you to charge up all your devices by using the sun.

Ultra-portable and mobile devices really aren't that mobile when you think about it. If you're going away for any length of time, there is always the usual entourage of chargers and power adaptors you need to lug along in order to keep your devices working. With the Power Monkey Explorer, you can leave everything behind and use the sun to power your gear.

Available in four colours, this compact, water-resistant and extremely sturdy unit is compatible with most mobile phones (including the second-gen iPhone), iPods, MP3 players, PDAs and portable games consoles including the PSP and the DS-Lite, so you can use it as your one-stop charging station. With one full solar charge, the Power Monkey Explorer will give you 96 hours of standby on your mobile, 40 hours on your iPod, five hours on your games console or 48 hours on your PDA.

The Power Monkey can be charged in three ways: via the solarmonkey solar panel, included universal mains charger, or via USB.

An LCD screen displays battery capacity and the level of charge. The Power Monkey Explorer also has short-circuit protection, over-charging protection and over-discharging protection. The included mains charger has interchangeable heads for UK, Europe, US and Australia — so you can use it in over 150 countries around the world! Now we only just have to hope it doesn't rain.

Christopher Zammit

CONTACT	Power Traveller
ONLINE	www.powertraveller.com.au
PRICE	$150

50 WORDS
. . .on what you watch.

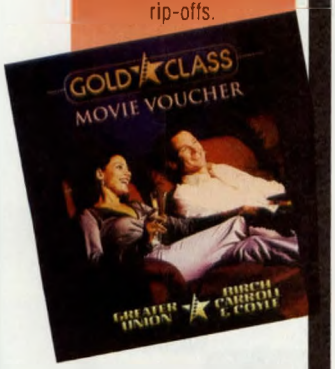
Watchmen has finally made the transformation from graphic novel to motion picture and is now out on on Blu-ray and DVD. So, to celebrate, Paramount has given us **5 Watchmen packs** to give away. To enter, just tell us in 50 words or less what graphic novels you'd like to watch on the big screen. Each pack includes a copy of *Watchmen* on DVD, a *Watchmen* Clock, a *Watchmen* Hoodie and a *Watchmen* Key Chain. Best of all, the pack includes a copy of the *Watchmen* book signed by the illustrator, Dave Gibbons. Sweet! Each prize pack is worth over $420, so get your entries in!

Entries close September 16th. Winners will be contacted by email.

Email your entry to:
downtime@acpmagazines.com.au

GOLD CLASS

Going to the cinema has come back into vogue with the creation of new high-class, high-comfort seating and service offerings. The illegal downloading of films has caused many viewers to appreciate the quality experience of the cinema over dodgy DVD rip-offs.



What's hot & not

TECHNOLOGY THERMOMETER

PIRATED MOVIES

We understand people love to torrent, but in some cases, watching a pirated film is nowhere near as good as seeing it at the cinema. Some people think they're crap quality with crap sound, and we could do without silhouettes of people walking past on the way to the bathroom thanks.

BLU-RAY PICKS OF THE MONTH

FAST & FURIOUS

Set between the events of *2fast 2furious* and *Tokyo Drift*, *Fast & Furious* continues the story of Dominic Toretto (Vin Diesel) as he goes on a mission of revenge against drug-dealing street racers. Amidst car chases, shootouts and looking moody, Dom ends up finding an unwanted ally in Brian O'Conner (Paul Walker), the undercover cop that set him free in the original film. With everything you've come to expect from the series — including insanely fast cars and implausibily beautiful women, *Fast & Furious* is an action-packed heart-thumper that is pure popcorn escapism. Even if you don't like cars. ***CZ***

CONTACT Universal Pictures
ONLINE www.universalpictures.com
PRICE $41.95

INKHEART

Brendan Fraser plays Mo (not the barman), who travels the world with his young daughter Meggie, in search of his missing wife. What Meggie doesn't know is that Mo is looking for her mother in a rare book called Inkheart. Mo is a Silvertongue (not from Lord of the Rings), whatever he reads aloud comes to life. When reading Inkheart years before, his wife swapped places with a character from the book who deperately wants to return. Aimed at families, Inkheart has a lot that will appeal to all ages. Great effects and a few funny moments make it worth a look. ***CZ***

CONTACT Roadshow Pictures
ONLINE www.village.com.au
PRICE $43.95

WATCHMEN - 2 DISC SPECIAL EDITION

Alan Moore's highly popular graphic novel finally springs to life in an extended version on Blu-ray. Set in an alternate 1985, the Watchmen follows a group of superheroes who join forces to investigate the murder of one of their own, only to find out that they are all being targeted. Watchmen is a *very* dark film that makes the Dark Knight look like a Disney musical. It has a stikingly gritty look and feel that is almost depressing, but works well. Amazing special effects and some insane action sequences make this at times hard to follow story more than watchable. Watchman is one of the better films of its genre. ***CZ***

CONTACT Paramount Pictures
ONLINE www.paramount.com.au
PRICE $41.95

Husqvarna Automower 260

Finally: a robotic lawnmower that can do the job unsupervised.

It's the 21st Century and the age of robot servants has arrived. Husqvarna has launched a new robotic lawnmower developed for homeowners with large lawns up to 6,000 metres square. Day or night, rain or shine, all on its own, this electrically powered beast cuts and fertilises the lawn without any emissions. Just like the good droid you've always wished for, if the mower gets disturbed, it sends an SMS to the owner's mobile phone asking for help.

Besides cutting the grass at the height of your choice with three ultra-sharp blades, the Automower fertilises the lawn naturally using the cut-offs from the grass. Thus eliminating the need for owners to empty a grass catcher.

CONTACT Husqvarna
ONLINE www.husqvarna.com/au
PRICE $4,000

The coolest thing about the Automower 260 ACX is the fact that it's battery driven and the unit recharges itself through an electrically powered charging station. After its average charge of 60 minutes cutting time is up, the Automower takes itself back to the charging station to recharge for 40 minutes before setting out to cut again. How cool is that? (And a little spooky.) If you see it going after the cat we recommend you make a run for it too.

Christopher Zammit

$4,000

8 10

Quikfix
New releases

GUITAR HERO: GREATEST HITS

The latest in the never-ending GH barrage sees the series take a step into its past. Red Octane has taken the best 48 tracks (arguably) from the previous five Guitar Hero releases and band-ified them to include not only the guitar track but also drums, bass and vocals. Greatest Hits is available now for the PS2, PS3, Xbox 360 and Wii.

PLANTS VS ZOMBIES

PopCap continues its dream run. Featuring can't-put-it-down gameplay, riotous humour and amazing attention to detail, this unlikely take on tower defence strategy sees you defending your home from a horde of zombies with an arsenal of protective plants. Heaps of variety, heaps to unlock, heaps to laugh at and heaps to enjoy. At only $29 to download, this is a solid 5/5.

Red Faction: Guerilla

Troy Coleman accidentally kills his brother with a giant hammer, loses game.

HAMMER TIME
Mario didn't like Mars; things seemed far gloomier than in the Mushroom Kingdom. Luckily, he still had his hammer.

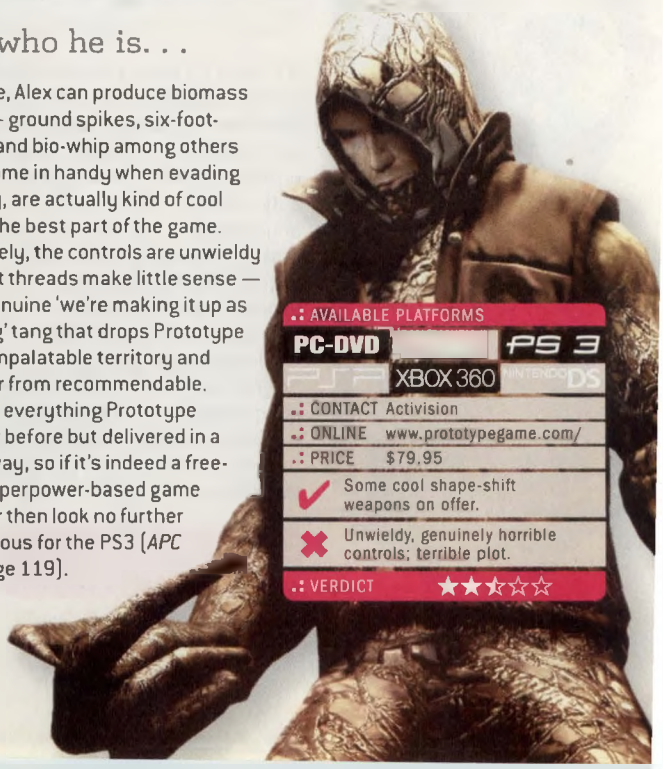
Developed by Volition, Red Faction is a third-person sandbox action shooter that has players taking a trip to a terra-formed and colonised Red Planet. As demolitions expert Alec Mason, players are roped into becoming members of the Red Faction guerrillas in their plight to overthrow the Earth Defence Force who have assumed strict control of the planet's resource trade with Earth. Players need to complete a series of missions and various guerrilla operations in up to six territories, which generally involve the mass-destruction of EDF buildings/property/soldiers in order to 'free the people' and unlock the next territory. As with all sandbox titles these days, RF is mission-based, and these vary from destroying key EDF targets, rescuing hostages and intercepting couriers to cut lines of communication. Actual terrain aside, everything in RF is deliciously destructible, and taking to vehicles and buildings with an assortment of weapons (pistol, rifle, proximity mines, and rocket launchers) and the often underutilised hammer never gets boring. Online multiplayer is also available and has a CoD4-style experience point perk system. There are six game modes including the Capture-the-flag and Deathmatch, plus a team-based destroy-everything-as-quickly-as-possible mode called Siege.

.: AVAILABLE PLATFORMS
PC-DVD | PS3 | XBOX 360 | DS
.: CONTACT THQ
.: ONLINE www.redfaction.com
.: PRICE $109.95
✔ Destroying everything with a massive hammer. . .
✖ . . . quickly gets forgotten when explodey weapons are unlocked.
.: VERDICT ★★★★☆

Prototype

Troy Coleman can't remember who he is. . .

Just what we need, I think to myself — another free-running, city-based, open-world game featuring a brooding late-teen with amnesia who tries to uncover the truth behind his grotesque genetic deformations while he broods broodingly. Set in a virus-infested New York City, players assume the role of Alex Mercer, a youth who wakes up in the morgue and discovers he has developed certain abilities that, on top of incredible strength and speed, allow him to shape-shift and consume people (absorb their skills, memories and appearance). Escaping the morgue, Alex discovers that the city is under military and Blackwatch (Special Ops) control as they try to contain the virus. Shape-shifting has its advantages, and as well as being able to assume another appearance, Alex can produce biomass weapons — ground spikes, six-foot-long blade and bio-whip among others — which come in handy when evading the military, are actually kind of cool and by far the best part of the game. Unfortunately, the controls are unwieldy and the plot threads make little sense — there's a genuine 'we're making it up as we go along' tang that drops Prototype deep into unpalatable territory and makes it far from recommendable. We've seen everything Prototype has to offer before but delivered in a far better way, so if it's indeed a free-roaming superpower-based game you're after then look no further than inFamous for the PS3 (*APC* August, page 119).



.: AVAILABLE PLATFORMS
PC-DVD | PS3 | XBOX 360 | DS
.: CONTACT Activision
.: ONLINE www.prototypegame.com/
.: PRICE $79.95
✔ Some cool shape-shift weapons on offer.
✖ Unwieldy, genuinely horrible controls; terrible plot.
.: VERDICT ★★½☆☆

Must play

FALLOUT 3: POINT LOOKOUT

The fourth content expansion for Bethesda's 2008 epic post-apocalyptic RPG Fallout 3 is now available for download from Xbox Live for 800 Microsoft Points (less than $15). Players take a ferry ride to Point Lookout (PL) where, unlike Capital Wasteland, no bombs were dropped. So instead of a desolate wasteland, players find themselves in a dank swamp filled with more than enough slack-jawed-hillbillies, ghouls, tribal cults and dank swampiness to VATS a pitchfork at. There are plenty of new quests and more than a few new weapons to collect on the way to uncovering the secret of this seaside town. PS3 owners will have to wait till the previous three content packs have been released until they can get their hands dirty in the swamps. Will we ever get sick of exploring the wastes? I certainly won't.

HUMAN 2.0
If you're feeling that it might be time to just press reset and try a seachange, then The Sims 3 could be for you...

AVAILABLE PLATFORMS
PC-DVD | Wii | PS 3 | PSP | XBOX 360 | NINTENDO DS

CONTACT EA
ONLINE http://thesims.ea.com/
PRICE From $89.95

✔ Limitless sim-life gaming opportunities.

✖ I spy a massive timesink.

VERDICT ★★★★☆

The Sims 3

Peter Dockrill finally gets a life. Sort of.

EA launched The Sims 3 recently with a glittery fashion show spectacular featuring pop stars, choreographed dance routines, catwalk models and the Chk-Chk Boom girl to boot — and the game succeeds in being *almost* as surreal.

The third iteration in the highest-selling computer game franchise ever offers a seemingly endless array of Sims-style life simulation pursuits. If you've spent any time with the series in the first two games, you'll know what to expect, but The Sims 3 expands upon the formulas developed in the earlier titles with an even stronger emphasis on personal customisation, a seamless game neighbourhood and more deeply integrated online features (including, natch, social networking elements).

After an extensive installation process, you create your Sims (in your very likeness, or not...) and plonk them in the default neighbourhood. And then, just *go*... If you've ever wanted to be an interior designer, this is probably the game for you — but heck, if you ever wanted to be a rock star (or a politician) then this is *also* probably the game for you. It's basically Second Life without the weirdos and with a more carefully polished and structured game-style presentation. The UI takes a bit of getting used to, but once you're versed in how to control everything via the comprehensive tutorials, you should have no problems.

Of course, the only real problem with this is that, unfortunately, there ain't eight days a week — and The Sims 3 does feel a lot like you're staring into the gaming abyss. But if that's what you're after, then The Sims 3 is a creative, funny and immaculately produced immersive gaming experience. Have fun.

Fuel

Troy Coleman wants to get out of the car and enjoy the view.

The kids over at Codemasters have created an absolutely stunning and huge racing zone in their latest all-terrain, adrenaline racer FUEL. Coming in at a whopping 14,000km², the globally-warmed, uninhabitable wastes are an apt setting for tattooed, shirtless show-offs to go head-head in *Mad Max*-esque modded vehicles in a bid to win the most precious commodity: fuel. The racing is divided between various camps, each of which has career mode races as well as a few extra race challenges, all of which earn the player more fuel, which can then be 'spent' to purchase one of over 70 vehicles across six classes, liveries or drivers. FUEL also lets players explore the environment outside of the racing arena, and this is where the game is at odds with itself.

Don't get me wrong, exploring is rewarding and the terrain is diverse and genuinely stunning; but if there's a fuel-shortage, how is it possible to drive around the countryside for four hours straight without so much as a toilet break? The big winner in FUEL is the tech behind such a vast game world, and its beyond-racing future-game potential should awaken the dormant RPG beast in everyone.

AVAILABLE PLATFORMS
PC-DVD | Wii | PS 3 | PSP | XBOX 360 | NINTENDO DS

CONTACT Atari
ONLINE www.fuel-game.com
PRICE $109.95

✔ Huge racing zone.

✖ Zone tends to feel empty when not in Career mode.

VERDICT ★★★½☆

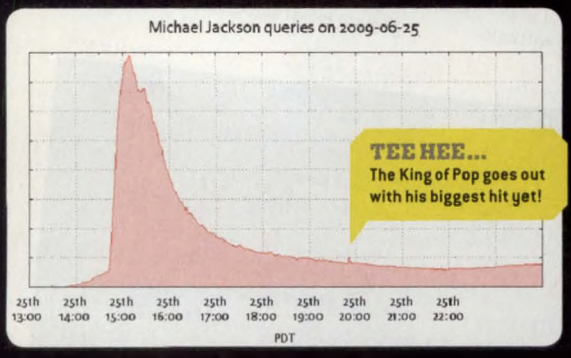
chipchat
BY PETER DOCKRILL

WHAT THE?
Don't ask us what the wheel is for... (perhaps it's an early scroll wheel?)

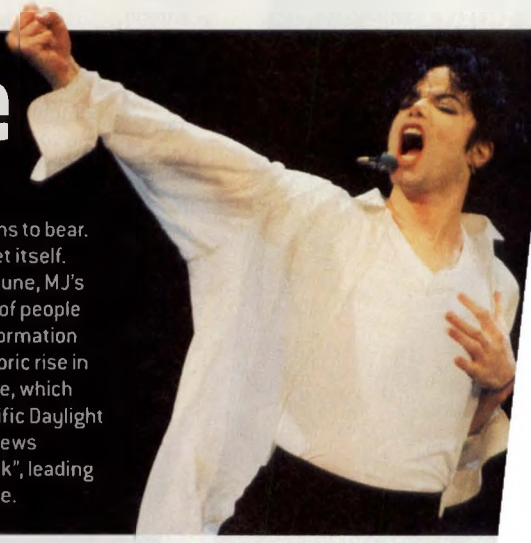
Wheel or unwheel?

When this pic did the rounds in the *APC* office, we were well and truly gobsmacked (and not a little amused). Was this for real? And what's with that wheel? The caption reads: "Scientists from the RAND Corporation have created this model to illustrate how a 'Home Computer' could look like in the year 2004. However, the needed technology will not be economically feasible for the average home. Also the scientists readily admit that the computer will require not yet invented technology to actually work, but 50 years from now scientific progress is expected to solve these problems. With teletype interface and the Fortran language, the computer will be easy to use." Alas, a quick Google search reveals it's a fake, as confirmed by rumour-busting sites **Snopes.com** and **Urban Legends**. The image is a Photoshopped mashup of a US nuclear submarine facade. And as for RAND Corporation? Nothing but a DARN red herring!

You are not alone



When news broke of the untimely death of 'King of Pop' Michael Jackson in late June, it was almost too much for many fans to bear. And the same could be said for the internet itself. As posted on Google's official blog on 26 June, MJ's passing resulted in "millions and millions of people from all over the world [searching] for information about the pop icon... [leading to a] meteoric rise in related searches". In fact, the search spike, which was at its most concentrated at 3pm Pacific Daylight Time 25 June, was so large that "Google News initially mistook it for an automated attack", leading to 25 minutes partial downtime for the site.



Enhance your moviegoing experience!

Say what you will, but: the internet, with its 'by the users, for the users' approach, *looks after its own*. How else would sites like **MovieStinger.com** and **RunPee.com** exist? MovieStinger alerts you to movies that have additional scenes after the credits roll (so you don't miss out on the hint-hint twist ending by leaving mid-credits); and perhaps even more useful, RunPee tells you when the boring or unimportant scenes are in a movie, so if you positively can't hold on anymore, you can strategically plan your toilet jaunt. Marvellous! Thanks to **Lifehacker.com** for alerting us to these indispensable cinema companions — more precious than an XL popcorn/drink combo (and better value too).

click to unscramble you will have approximately **4 minutes** to RunPee while...

The mother T-Rex is carrying her babies through the jungle. Manny, Ellie, Diego and Buck are following her. They come upon the "Chasm of Death". Buck helps them cross the chasm by rigging up a swing using the rib cage of a dinosaur. Ellie makes it across fine, but when the rest are crossing they are overcome by a vapor that causes them to laugh uncontrollably. They do eventually make it across, laughing all the way.

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6962-1	Automatic 1 to 1 Duplicator	$1269
6963-1	Automatic 1 to 5 Duplicator	$4799
6964-1	Automatic Burn & Print 1 to 1	$2799

Cat 6946

Cat 6963

HDMI

Cat. No.	Description	Price
23055-1	2 Port Switch	$89
23054-1	4 Port Switch	$129
23053-1	2 Port Splitter	$129
23052-1	4 Port Splitter	$199
1008297-1	2m HDMI Cable	$20
1008325-1	5m HDMI Cable	$34
1008326-1	10m HDMI Cable	$49

Cat 23055

Cat 23052

Device Extenders

Cat. No.	Description	Price
11683-1	USB Extender to 60m over LAN cable	$99
3627-1	DVI Extender to 15m over LAN Cable	$169
3628-1	DVI Extender to 45m over LAN Cable	$269
3441-1	VGA Extender to 130m over LAN Cable	$399
11625-1	Console Extender to 80m over Standard Cables	$179
11662-1	Console Extender to 150m over LAN Cable	$399
11812-1	Wireless TV/Video Sharer to 100m (2.4Ghz)	$79

Cat 11683

Cat 3441

What's New?

USB Digital Endoscope

MicroGrams USB Digital Endoscope lets you see inside hard to reach places. Featuring adjustable LED lighting and a 60cm long semi-flexible tube to the camera lens this unit is perfect for household, mechanical or industrial use. The camera lens has a diameter of 14mm allowing it to fit into very small spaces. The handle of the USB endoscope has a snap shot button, and a LED lighting adjuster. This allows the user to control everything from the endoscope and not have to go back to the software (included) on their PC or Notebook. Video and images can be saved to view back later. **Cat. 3747-1 $119**

Cat 3747

26" LCD TV with Integrated PC

Save space and money with this unique hybrid.

This great new TVISIO hybrid LCD PC allows you to watch TV, play DVDs and games consoles or work in Windows all with the press of a button. You can even watch TV while working in Windows with the picture-in-picture (PIP) function. These are great for use in the home-office, as a point-of-sale display, as a digital signage solution or as a personal media centre perfect for the living room or bedroom. **Cat. 1410-1 $1699**

Cat 1410

USB Tablet Attachment

Perfect for Notebooks & Netbooks

MicroGrams USB Tablet Attachment is an innovative pen input device providing full tablet functionality with simple installation. The device is made up of a webcam-sized receiver that sits on the top of your laptop's screen, and captures movement through a special tablet pen. The tablet pen has standard stylus type functionality like a pressure sensitive tip and side buttons to duplicate the mouse buttons.

You can also replace the tip on the stylus with an ink filled tip, then simply move the transceiver from your notebook screen to what you plan to write on and you can now produce hard copies of your drawings and written text while simultaneously creating a digital copy.

It's only compatible with Microsoft Windows XP and Vista, but it acts just like a real tablet, making it possible to draw, write, sketch, and illustrate. You don't even have to touch the pen to the screen - It works on the air, just like the Nintendo Wii. **Cat. 9669-1 $319**

Cat 9669

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Cat. 11683-1 $99

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We offer FREE phone support to assist you in the initial setup of any product purchased from us.

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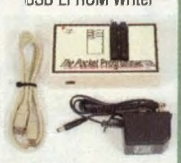
USB Microscope

Cat. 3686-1 $385

USB EPROM Writer


Cat. 3655-1 $499

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Cat.1171-1 $525

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Cat. 6303-1 $289

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anniversary celebration

3 Times LUCKY Draw

Win!!
Some awesome prizes

Date: 22nd August (Sat)
Time: 11:00am~15:00pm
11:00 - Pre Lunch
Drinks & snacks + 3rd Prize
12:00 - BBQ Lunch
13:00 - 2nd Prize
14:00 - 1st Prize

We invite you to join our anniversary celebration on 22nd August @9289 Showroom (Chatswood NSW)

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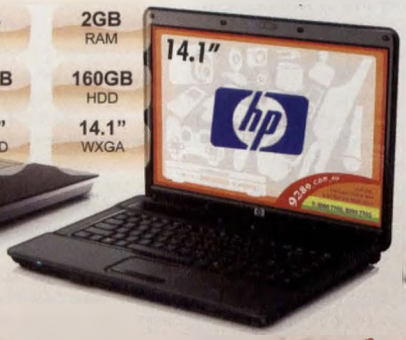

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CRU2 is designed to connect direct to ANY telephone line extension, to provide High Quality telephone call recording to your PC (PC software provided) or other recording device. Provides automatic operation with start/stop capability from any telephone.

HANDSET CONNECT model

CRU3 is designed to connect to any PABX, COMMANDER, PSTN or VOIP handset. Will then provide High Quality telephone call recording to your PC (PC software provided). Automatic operation with start/stop activation from your PC.

PROFESSIONAL model

CRU4 provides all facilities of the CRU3 Model (it connects to any handset) and in addition allows message(s), or previous recordings to be played back to the other party at any time. Allows notes to be tagged to the recording file.

AUTO DIGITAL ANNOUNCEMENT

Our AUTOMATIC ANNOUNCEMENT DEVICE wi Answer your incoming telephone calls, play a announcement and then resume ringing of your telephones. Ideal for announcing change of number or that the call will be recorded.

TELEPHONE LINE DOOR STATION SOLUTION

DOOR STATION UNIT

DS2 will RING all of your telephones when a visitor arrives at your front door or gate. Answer to communicate. Open the door or gate with touch tones. Op ordinary single line or multi-line phone sy surface mount or flush mount door phone

PABX DOOR STATION UNIT

DS4 is designed to be connected to an analogue extension of any PABX, Commander or other multi line telephone system. DS4 goes "off hook" when activated by the door phone. Requires surface mount or flush mount door phone.

DOOR STATION DIAL OUT

Our New DS6 model will RING your telephones and then DIAL OUT to a pre-programmed telephone number if a visitor arrives and you are not home. Requires Surface Mount or Flush Mount Door Phone. Can also connect to a PABX extension.

DOOR PHONES

A range of door phones are available

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FAXSTREAM DUET SWITCHES

Will allow your Fax or Modem device to operate with the Telstra FaxStream Duet service.

Provides fully automatic fax reception, just like having a separate line. Two models are available.

INTELLIGENT FAXSWITCH

FAX SWITCH will allow your existing Fax Device to connect to a Single Telephone line or a Multi Line (PABX) phone system, to provide for FULLY AUTOMATIC Fax operation. Will operate with all existing telephones and also an Answering machine.

INTELLIGENT MODEMSWITCH

MODEM SWITCH allows your existing Data Modem Device to connect to any Single Telephone Line, Fax Line or a Multi Line (PABX) phone system, to provide for FULLY AUTOMATIC Dial In & Dial Out Modem Data operation. Models available that allow up to 8 devices on 1 line.

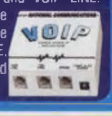
EFTPOS SWITCH

EFTPOS switch will allow your existing EFTPOS device to sha any existing Single Telephone Line, Fax Line or a Multi Line (PABX) phone system. Provides automatic connection on dialing. BARGE-IN protection prevents interference when line is in use. Alternative model will allow operation on 2 lines.

MISCELLANEOUS TELEPHONE LINE APPLICATION

VOIP SELECTOR

This device will allow you to connect one or more telephones to your TELEPHONE LINE and VOIP LINE. Incoming calls from either line ring on the connected telephone(s). Outgoing calls are automatically DEFAULTED to ONE LINE, but the alternative line can be selected by DTMF code.



TWO LINE SELECTOR

Premium device will allow you to connect one Telephone Device to two Telephone lines (Telstra, Optus, VOIP, PABX etc). Ideal for EFTPOS, Cordless Phones, Modems etc. Additional features are provided, including automatic (or manual) selection of an alternative line if the default line is busy.

TELEPHONE CALL TRANSFER

Easy-Transfer will allow you to answer a call on one telephone and then TRANSFER the call to another telephone fitted to the same line. Also provides INTERCOM facility. Uses your existing telephones.

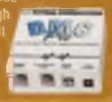
MULTIPLE NUMBER SWITCH

Operate Two numbers on one line. This device will conne your Multiple number calls to one set of phones or answering machine and your Normal number calls to another set of phones or answering machine.

TELEPHONE LINE ON HOLD SOLUTIONS

DIGITAL ON HOLD

DMC Australia's Leading On Hold player, is an MP3 based Message On Hold Device, designed to provide the High Quality and High Reliability that is necessary for all telephone On Hold applications. Easy message change provided by replacing memory card.



ELECTRONIC MESSAGE UPDATE

DMS is available with range of optional Automatic electronic message update methods including Email, Modem, FTP and Network IP. We have a National Network of Dealers ready to produce your customized message.

SINGLE LINE ON HOLD

Just plug our MOH Line Sharer into any socket on your single telephone line, connect any audio source (Radio, PC or DMC) and you now have a professional telephone line On Hold facility for your existing telephones.

AUTOMATIC CALL ATTENDANT

Our single line CALL ATTENDANT will answer yo incoming calls after a preset number of rings, pla a greeting & then put your call on hold until you are able to answer. Also provides Message on Hold facility for your single line.

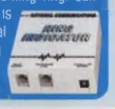
MORE MISCELLANEOUS EQUIPMEN

TELEPHONE LINE SIMULATOR

This TELEPHONE LINE SIMULATOR can be used for testing, programming & demonstration of analogue telecommunications equipment, without the need to use a telephone line and generating costly calls. 4 Models are available.

RING INDICATOR

This device detects incoming calls and will close/open a relay to match the cadence of the incoming ring. Can also be set to close a relay until a call is answered. Ideal for control of external horns or lights to advise of an incoming telephone call.



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Call in to Switch ON, Switch OFF or RESET your PC, SERVER or any electrical device by telephone line using touch tone commands. RTA connects to any telephone line. Requires PCU accessory. 3 models are available.

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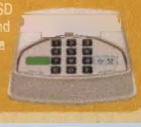
PCU connects direct to the RTA and also to your pow socket to allow telephone line dial in switching of the 240V supply connected to your equipment. Easy Plug In User Installation. Controls up to 10 Amps.

DIGITAL AUDIO EQUIPMENT

MESSAGE ON DEMAND

TDS can be programmed with up to 256 MP3 based messages stored on an MMC/SD card, which can be recalled and played by keypad entry or time programmed sequences.



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High Quality BMS holds up to 8GB of MP3 Music/Messages on a SD Flash Card. Plays Messages at user set intervals. Powerful internal amp will allow direct connection of up to 8 speakers. Line Level output is also provided. Has encryption facility.

TALKING DISPLAY UNIT

TDU will play 1 or more pre-recorded messages as soon it is triggered by a movement sensor, a switch, or a preset time interval. Ideal for Product Promotions, Product Information, Message Warnings etc.

MULTIPLE INPUT UNIT

MIU will allow for up to 12 separate movement sensors switches to be connected to the TDU. Each sensor trigg its own unique message, output via any 8 ohm unpowered, powered or amplified speaker.

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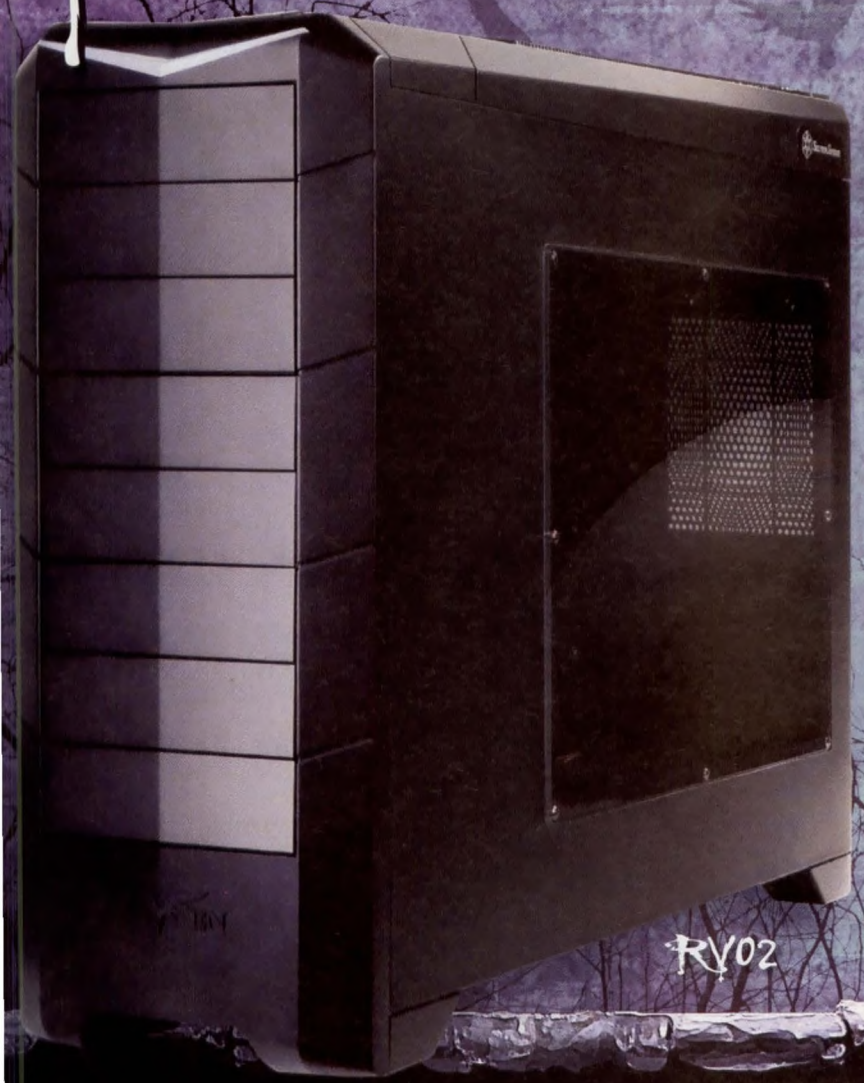

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Lenovo S10e IdeaPad

- Intel Atom 1.6GHz
- 1GB DDR2 RAM
- 160GB HDD
- Windows XP Home
- 6 Cell battery

$529
Save $170
Harris Technology $599

WebCode - Black: LNB9511

Acer X243HQ 23.6" Widescreen

Perfect balance between best value performance with full high definition

- Response: 5ms
- Res: 1920x1080
- Contrast: 40000:1
- Brightness: 300cs/m2

$239
After $49 Cashback
Save $410

WebCode: ACM0146

1TB Western Digital HDD With Astone Enclosure

External HDD stands out from the crowd

- eSata & USB 2.0 Connectivity
- Supports Hot Swapping
- PC & Mac Compatible

$147

WebCode: AST0019

$529
Save $370

Samsung CLP-610ND Colour Laser

WebCode: SAM0610

$799
Save $300

Samsung SCX-5635FN Mono Multifunction

WebCode: SAM5635

$1599
Save $1100

Samsung SCX-5835FN Mono Multifunction

WebCode: SAM5835

QuickBooks Plus 2009/10

Track inventory & Payroll

- Integrated payroll management
- Process credit card payments
- Import bank statements

$489
Save $106
Harris Technology $565

WebCode: QUI0169

AVG Authorized Reseller
symantec. Symantec Gold Partner
Microsoft CERTIFIED Partner
Adobe Silver Partner
Premier Partner hp
NUANCE Reseller of the Year 2008
SAMSUNG
MYOB

Take your design

TurboCAD 16 Deluxe 2D/3D

Unlimited design options

Hundreds of professional drafting and design tools, incredible file support, video and interactive tutorials, photorealistic rendering and millions of drag and-drop symbols provide everything you need to create presentation-ready home plans, technical drawings, mechanical designs, artistic illustrations, crafts, school projects and much more. Compatible with over 28 industry standard file formats including AutoCAD and Google Sketchup.

WebCode: IMS0153

Adobe Photoshop Lightroom 2 - Academic

Simplify photography from shoot to finish

- Enhance specific areas of a photo precisely adjust overall color, exposure, and tonal range.

WebCode: AEP9567

Corel Paint Shop Pro Photo X2 Ultimate

A complete photo-editing software solution

- Instantly fix common problems such as red eye, color & sharpness
- Add special effects to photos, text & projects with a few simple clicks

WebCode: COR9203

Adobe Photoshop / Premiere Elements & Lightroom 2

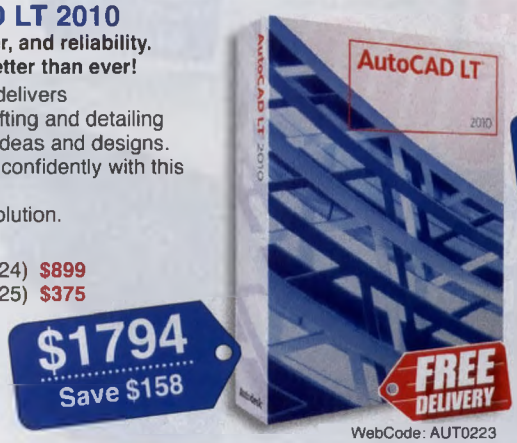
Adobe Photoshop Elements 7	ALD0404	$99*	SAVE $70
Adobe Premiere Elements 7	ALD1263	$109*	SAVE $60
Adobe Photoshop Elements 7 & Adobe Premiere Elements 7	ALD0402	$239	SAVE $46

AutoCAD LT 2010

Efficiency, power, and reliability. But now it's better than ever!

AutoCAD LT software delivers comprehensive 2D drafting and detailing tools for documenting ideas and designs. Create technical plans confidently with this comprehensive CAD drawing and drafting solution.

Upgrade (AUT0224) $899
Subscription (AUT0225) $375



WebCode: AUT0223

Pinnacle Studio 12

Not just video editing software

Pinnacle Studio offers everything you need to make home movies. Edit and polish your videos to your hearts content.

WebCode: PIN0184

Pinnacle Studio 12 Ultimate

A complete video-editing solution

Take advantage of the latest HD video editing technologies, including Blu-ray and AVCHD

Crossgrade from any other video editing program (PIN0201) $155

WebCode: PIN0183

AutoCAD 2010

Take design further

Speed up documentation, share designs accurately, and explore ideas more intuitively in 3D. AutoCAD software provides the ultimate in power and flexibility, customizable for your specific needs.

Subscription (AUT0233) $730
Upgrade from 2009 (AUT0234) $950
Upgrade from 2008 (AUT0235) $1,727
Upgrade from 2007 (AUT0236) $2,870

WebCode: AUT0231

Pinnacle MovieBox Plus - USB

Capture HD video & create beautiful movies

Combining power and simplicity, Pinnacle Studio MovieBox Plus unlocks the latest HD video technologies, including Blu-Ray and AVCHD. MovieBox Plus includes Pinnacle Montage theme-based editing which puts incredible creative power at your fingertips. Very easy to make a masterpeice.

WebCode: PIN0200

to a new level...!

MAC VERSIONS AVAILABLE ONLINE

Components	Design Premium	Design Standard	Web Premium	Web Standard	Production Premium	Master Collection
InDesign CS4	●	●				●
Photoshop CS4 Extended	●		●		●	●
Photoshop CS4		●				
Illustrator CS4	●	●	●		●	●
Acrobat 9 Pro	●	●	●			●
Flash CS4 Pro	●		●	●	●	●
Dreamweaver CS4	●		●	●		●
Fireworks CS4	●		●	●		●
Contribute CS4			●	●		●
After Effects CS4					●	●
Premiere Pro CS4					●	●
Soundbooth CS4			●		●	●
OnLocation CS4					●	●
Encore CS4					●	●
Shared features services and applications						
Bridge CS4	●	●	●	●	●	●
Device Central CS4	●	●	●	●	●	●
Dynamic Link					●	●
Version Cue CS4	●	●	●	●		●

Adobe

Creative Suite 4

Get the tools you need to create any content

Design Premium Win - Student	ADS0025	CALL
Design Premium Win - Academic	AEP0072	$878
Design Premium Win	ALD1207	$2,497
Design Standard Win - Student	ADS0028	CALL
Design Standard Win - Academic	AEP0074	$648
Design Standard Win	ALD1209	$1,988
Web Premium Win - Student	ADS0033	CALL
Web Premium Win - Academic	AEP0085	$848
Web Premium Win	ALD1215	$2,369
Web Standard Win - Student	ADS0035	CALL
Web Standard Win - Academic	AEP0087	$575
Web Standard Win	ALD1217	$1,398
Production Premium Win - Student	ADS0031	CALL
Production Premium Win - Academic	AEP0078	$874
Production Premium Win	ALD1213	$2,387
Master Collection Win - Student	ADS0024	CALL
Master Collection Win - Academic	AEP0076	$1,396
Master Collection Win	ALD1211	$3,438

Save up to $1,602!

CorelDRAW Graphics Suite X4

New & improved Corel Graphics suite

CorelDRAW Graphics Suite X4 lets you tackle creative graphics and design projects with confidence.

- Precision tools
- Market-leading file compatibility
- High-quality content
- Create distinctive logos and signs
- Create striking marketing materials

WebCode: COR8968

Corel Painter 11

The most inventive digital painting software on the market.

Corel Painter 11, software that delivers the most advanced photo painting and natural media tools available today.

WebCode: COR8712

*Student/Academic ID Card Required

Total Training CS4

Master your software with Video Training.

TT Indesign CS4	TOT0091
TT Illustrator CS4	TOT0090
TT Photoshop CS4	TOT0089
TT Dreamweaver CS4	TOT0088

Nero 9

Simply Create, Rip, Burn, Copy, Share, Backup, Play, and Enjoy

The next generation of the world's most trusted integrated digital media and home entertainment software suite.

WebCode: NER0043

Roxio Creator 2009

Easily protect what you can't replace

Delivers the industry's best & burning and copying tools for protecting your life stories, digital media and files.

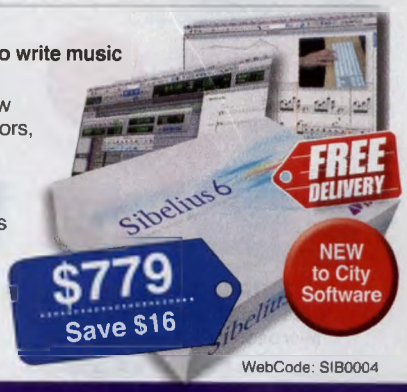
WebCode: ROX5010

Sibelius 6

The fastest, smartest & easiest way to write music

Sibelius 6 is a giant leap forward in notation software – with amazing new features and improvements for educators, students, composers, arrangers, copyists and musicians of all kinds.

- No more tidying up scores
- Track changes & compare versions
- Conduct your scores
- Great new sounds – in no time
- Beautiful Keyboard & Fretboard windows



WebCode: SIB0004

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Up to an additional 50%

Microsoft Office

Microsoft Office Home & Student 2007

Great for families, excellent for students

Easily create great-looking documents, worksheets and presentations, as well as manage notes and information at home.

- Microsoft Excel
- Microsoft Powerpoint
- Microsoft Word
- Microsoft OneNote

3 User

$139 Save $70

WebCode: MSA6101

Microsoft Office Small Business 2007

Tools to help small businesses work more efficiently

- Microsoft Excel
- Microsoft Powerpoint
- Microsoft Publisher
- Microsoft Word
- Microsoft Outlook with Business Contact Manager

FREE DELIVERY

$618 Save $71

WebCode: MSA6105

Microsoft Office Suites

Create visually stunning documents, worksheets & presentations

Office Outlook Academic 2007	MSA6121	$84	SAVE $14
Small Business Upgrade 2007	MSA6106	$363	SAVE $86
Professional 2007	MSA6108	$732	SAVE $167

Nuance Dragon NaturallySpeaking 10

Voice Recognition, Speech-to-text software, perfect for dictation

Standard	NUA0093	$153	SAVE $46
Preferred + BONUS 1GB iPod	NUA0133	$259	SAVE $90
Preferred Wireless	NUA0105	$459	SAVE $140
Professional	NUA0097	$1,198	SAVE $201

Nuance PDF Converter Enterprise 6

Create, Convert, Edit and Share. Better PDF for Business

- Everything you need to Create, Convert, and Edit PDF files.
- Create 100% industry-standard PDF files.
- Convert PDF files into editable, formatted documents.
- Edit directly within PDF– correct typos, add notes & adjust graphics.

$99.95 Save $120

WebCode: NUA0130

$59.95 Save $30

Nuance PDF Create 6

Create secure PDF files from any PC application

Create documents up to 3 times faster than with other PDF applications, with results that are universally viewable from virtually any PDF viewer.

WebCode: NUA0128

$159 Save $140

Nuance OmniPage 17

Never retype or reformat a document ever again!

- Increased word accuracy
- Faster launch times
- One-click toolbar in Microsoft Office
- Asian language recognition

WebCode: NUA0112

$258 Save $113

SmartDraw 2009

Create stunning artwork in Microsoft office with ease

Quickly create the business graphics you need to succeed, and is the perfect companion product to Microsoft Office.

WebCode: SMT0071

$759 Save $22

Crystal Reports 2008

Design interactive reports connect them to virtually any data source

- Leverage professional reporting
- Empower end users to explore reports with on-report sorting and parameters

WebCode: SCR2008

$229 Save $50

ACT! by Sage 2009 v11

#1 Selling Contact Manager

Keep all your important relationship details for quick, organised access to the information you need.

WebCode: ACT0039

$597 Save $262

Adobe Acrobat 9 Pro

Protect documents with PDF

Communicate and collaborate more effectively and securely with virtually anyone, anywhere.

WebCode - WIN: ALD9652
WebCode - MAC: ALD9651

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FREE 12 months of upgrades & phone support included!

QuickBooks Accounting 2009/10	QUI0176	$265
QuickBooks Plus 2009/10 + Bonus CRM	QUI0177	$488
QuickBooks Pro 2009/10 + Bonus CRM	QUI0178	$739
QuickBooks Premier 2009/10 + Bonus CRM	QUI0179	$1198

MYOB Accounting Range

Built for Australians by Australians

MYOB Accounting 18	MYB0086	$262
MYOB Accounting Plus 18	MYB0087	$467
MYOB Premier 12	MYB0089	$1,198
MYOB RetailManager 11 + BONUS Hand Scanner	MYB0099	$1,599

Quicken Personal Plus 2009

Manage your investments

- Budgeting tools to help you save and plan for your future
- Monitor all of your personal and business investments

WebCode: QUI0169

Reckon Retail Starter Kit 2009/10

FREE 12 months of upgrades & support

- QuickBooks Plus 09/10
- Retail Point of Sale Lite 09/10
- Includes: Receipt Printer, Cash Drawer, & Barcode Scanner

WebCode: QUI0189

MYOB RetailReady

Point of sale Hardware & Software

MYOB RetailReady contains all the software and hardware you need to turn your PC into an effective Point of Sale (POS) solution. RetailReady processes sales fast, reports GST and performs "Cash Ups" in just a few clicks.

Includes:

- MYOB Retail Basics
- Barcode Scanner
- Thermal Docket Printer
- Electronic Cash Drawer

WebCode: MYB0040

Microsoft Visual Studio 2008

Professional development software

Visual Studio 2008 provides a full-featured development environment for Windows and Web developers. Offering productivity enhancements for building data-driven client and Web apps. Individual developers looking to create connected applications with next-genuser experiences will find Visual Studio 2008 a perfect fit.

Standard Full	MSA9888	$470
Standard Upgrade	MSA9887	$312
Professional Full	MSA9889	$1275
Professional Upgrade	MSA9890	$872
Professional Subscription w/ MSDN	MSA9904	$1949

CodeGear Delphi 2009 Professional

Professional Win32 Development

Delphi 2009 is the development environment of choice for software developers and database application developers building high performance rich UI native Windows applications. Internationalise your applications with new Unicode support throughout the Delphi environment. Build powerful, efficient and secure database applications with Datasnap technology. Build AJAX enabled web apps with VCL for the Web.

WebCode: BOR0191

ER/Studio Standard

Industry leading Data Modelling tool

ER/Studio provides an easy-to-use visual interface to document, understand, and publish information about existing databases. Reverse engineering of industry-leading database systems allow you to compare and consolidate common data structures without creating unnecessary duplication.

Data modellers can create an information hub by importing, analysing, and repurposing metadata from all data sources.

WebCode: EMB0002

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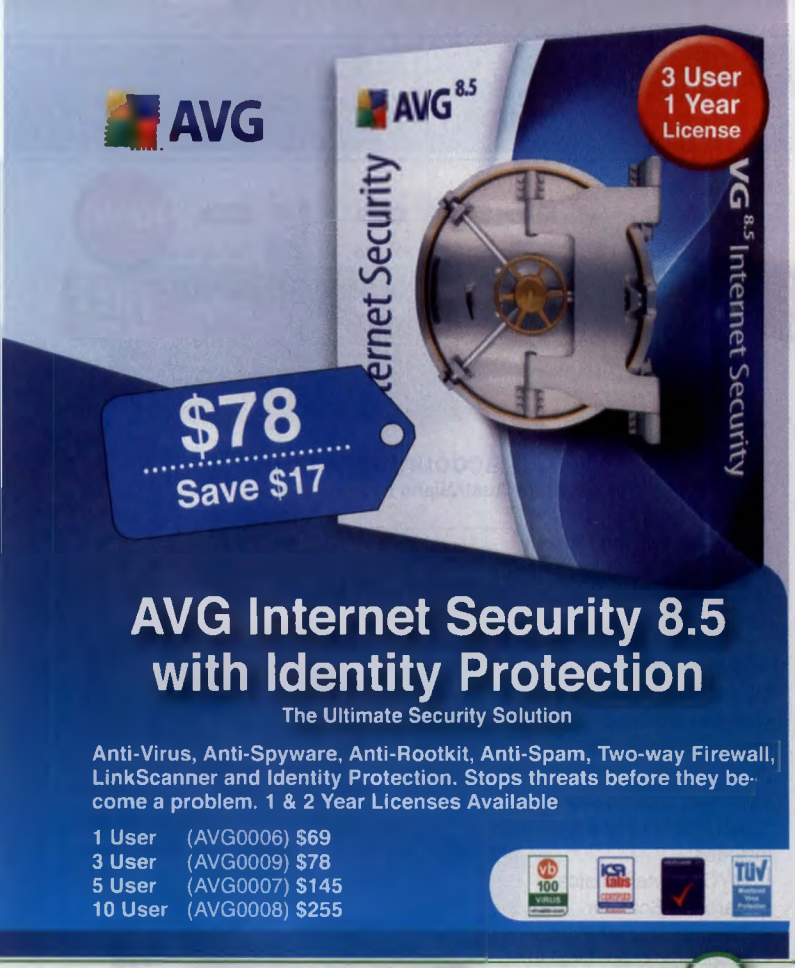


AVG Internet Security 8.5 with Identity Protection

The Ultimate Security Solution

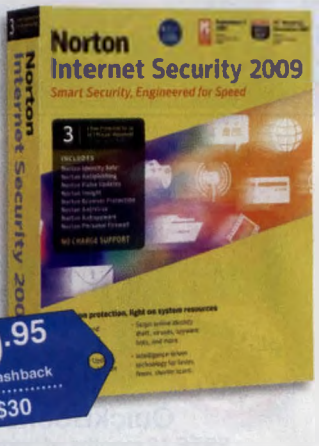
Anti-Virus, Anti-Spyware, Anti-Rootkit, Anti-Spam, Two-way Firewall, LinkScanner and Identity Protection. Stops threats before they become a problem. 1 & 2 Year Licenses Available

1 User	(AVG0006)	$69
3 User	(AVG0009)	$78
5 User	(AVG0007)	$145
10 User	(AVG0008)	$255

Norton Internet Security 2009 - 3 User

Protection for ALL Users!

- Re-engineered for speed
- Unique technology for faster, fewer scans
- Up-to-the-minute protection against identity theft, spyware, viruses, spam, bots, keyloggers and new threats
- Silent mode for games & movies
- Wireless network security
- Fully configurable



1 Year License

3 User	(SYM9956)	$59.95*
5 User	(SYM9957)	$100*
10 User	(SYM9958)	$179*

Trend Micro Internet Security Pro 2009 - 3 User

Comprehensive internet security

- Anti-virus
- Anti-spyware
- Email safety scans
- Protection against rootkits
- Proactive intrusion blocking
- Anti-spam
- Two-way firewall
- Home network protection
- Website authentication
- Advanced parental controls

1 Year License

3 User	(TPK0010)	$99
5 User	(TPK0017)	$168
10 User	(TPK0018)	$299

Did you know?

4.4 Million Australians have been affected by identity theft.

Kaspersky Internet Security 2010 - 3 User

New & Improved Version

- Improved advanced identity theft protection.
- Special Gaming mode, to suspend alerts while you play.

WebCode: KAS0014

Kaspersky Small Office Security - 5 User

The latest in Small office Security

- Improved Protection for Shared File Servers
- Maintain email & computer network availability
- 1 Year License

WebCode: CAI0002

Avira AntiVir Internet Security 2009 - 3 User

Product of the Year in Independent "AV Comparatives" 2008 testing

- Winner of CNET Editor's Choice Award - April 2009
- Over 70 million customers worldwide.
- Protects against viruses, rootkits, phishing, spyware, and other highly infectious files.
- 1 & 2 Year Licenses Available

2 Year License

1 User	(AVI0107)	$99
3 User	(AVI0110)	$144

Norton Utilities 14

Optimise your PC, for speed!

- Automatically finds and fixes common problems
- Accelerates startups
- Defrags disk for faster performance

WebCode: SYM9990

Acronis True Image Home 2009 - Windows

Backup and recovery that is EASY to perform!

- Easy Rollback of system changes
- Smart Scheduling
- Password based encryption

WebCode: MAN0155

McAfee Total Protection 2009 - 3 User

Ultimate, Easy-to-Use PC Protection with Powerful Web Site Safety Advisor

Now available with revolutionary Active Protection technology, offers you and your family the ultimate PC security with accelerated performance, for online activities, personal files and home networking

1 Year License

3 User	(MFE0008)	$100
6 User	(MFE0010)	$150

Family Tree Maker 2009 Platinum Edition

Learn more about your family.

Everything you'll ever need to trace your ancestors from Australia and beyond is included in Family Tree Maker 2009 – Australian Edition, because it integrates seamlessly with www.ancestry.com.au. Ancestry.com.au is the largest available database of Australian and New Zealand ancestors, and is part of Ancestry.com – the biggest genealogy database in the world. Family Tree Maker is the packed full of resources, so spending hours in the library under the microfiche is a thing of the past, it's all there at your fingertips.

$89.95
Save $15

WebCode: AVA1012

TurboFloor Plan 3D Home & Landscape Pro 14

Design your dream home with a click.

TurboFLOORPLAN 3D Home & Landscape Pro's intuitive interface and helpful wizards make it easy to design your dream home, remodel your existing one and create the perfect outdoor living experience.

- Fast! Wizard-driven software
- Design an Australian home with 100's of industry standard objects and plants
- Take a virtual walkthrough and see your designs in photorealistic 3D

$99.95

WebCode: IMS0151

$29.95

The Big Box of Languages

70 Languages in one!

- Comprehensive grammar references with alphabet overview
- Voice Recognition for Pronounciation
- Advanced speech analysis with a listen and speak feature
- Each with 7 fun interactive games

WebCode: NOD0001

$45

Mavis Beacon Teaches Typing Deluxe 20

Type Better - Email Faster
Work Smarter

- Dynamic personal instruction.
- 12 fun & challenging typing games
- Over 325 practice session options

WebCode: BRD0039

FileMaker Pro 10

Manage People, Projects, Assets, and More

Whether you need to manage client information, track project details, or produce inventory reports, FileMaker Pro 10 helps you get your important information organized in one place so it's instantly accessible

- **New!** Status Toolbar – Put commonly used features at your fingertips with the redesigned interface. Plus customise the toolbar with features you use the most.
- **New!** Script Triggers - Create and run scripts prompted by user actions for increased productivity

$465
Save $34

WebCode: FIL2500

Once you go MAC you wont go back!

Roxio Toast 10 Titanium Pro

Leading Mac burning suite

The best way to get pro-quality results in burning, video and photo projects. Enjoy all the power of Toast 10 Titanium plus Blu-ray video authoring and four award-winning photo and audio applications.

High-Def/Blu-ray Disc Plug-in:
High-def to DVD: author HD video to standard DVDs for playback on Blu-ray players.

$175
Save $74

WebCode: ROX5012

The 13 inch MacBook

The next generation notebook

$1554

- Intel Core 2 Duo 2.13GHz
- 2GB DDR2 Memory
- 160GB hard drive1
- NVIDIA GeForce 9400M graphics
- Standard keyboard
- White polycarbonate shell

FREE DELIVERY

WebCode: APP0691

$184
Save $45

Microsoft Office 2008 Home & Student Edition - Mac

Perfect for families & students

Professional design is within your power with hundreds of new customizable templates and suite-wide themes, everything you need in the one office suite.

WebCode: MSA3770

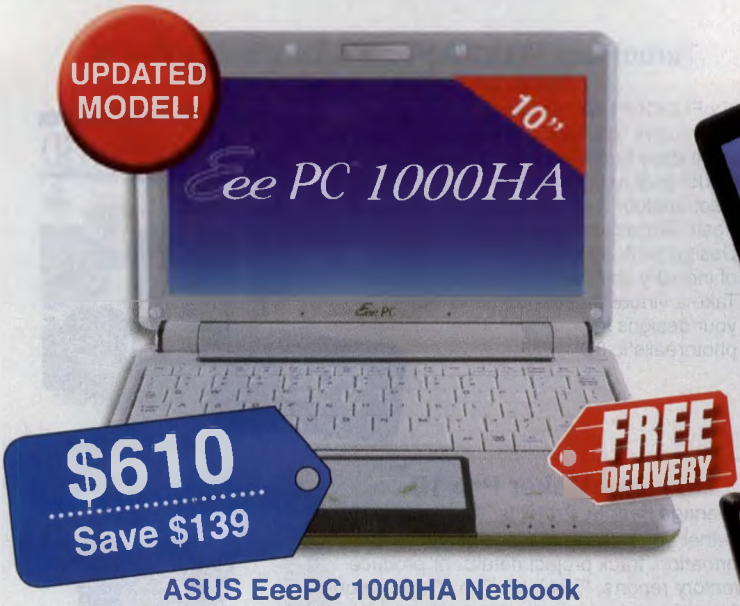
$79

Bento 2

Personal Database by Filemaker

Now you can organise your important information and keep contacts, calendars, emails and events, files and photos-all in one place.

WebCode: FIL2098



ASUS EeePC 1000HA Netbook

Go anywhere in style!

Take to the streets with stable and reliable computing on-the-go, with up to 7 hours of battery life, and exclusive 10GB Eee Storage makes it the ideal traveling companion for outdoor activities.

- Intel Atom N280 1.66GHz
- 1GB DDR2 RAM
- 160GB HDD
- Windows XP Home
- 6 Cell Battery

WebCode: Black - ASE10013
WebCode: White - ASE10014

Acer Aspire One D250

Just 1" thin and feather light at 1.11kg, the 10.1" Aspire One D250 is the ultimate take-me-with-you device for the individual on the go!

- Intel Atom N270 1.6GHz
- 1GB DDR2 RAM
- 160GB SATA HDD
- Windows XP Home
- 3 Cell battery

WebCode - Black: ACE1002

Lenovo S10e IdeaPad

Slim, light, easy to use and very budget friendly. Perfect for first time netbook shoppers or families needing an additional PC.

- Intel Atom N270 1.6GHz
- 1GB DDR2 RAM
- 160GB HDD
- Windows XP Home
- 6 Cell battery

WebCode - Black: LNB9511

Netbooks

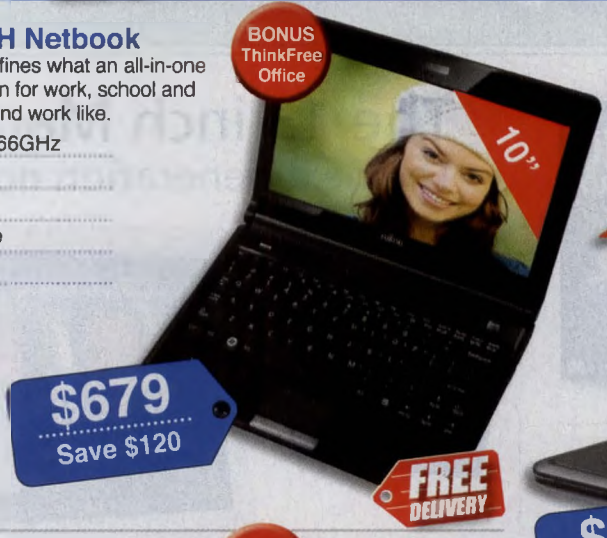
- Longer Battery Life
- Greater Portability
- Cheaper Price

Fujitsu M2010H Netbook

The Fujitsu M2010 defines what an all-in-one nifty mobile companion for work, school and play should look like and work like.

- Intel Atom N280 1.66GHz
- 1GB DDR2 RAM
- 160GB HDD
- Windows XP Home
- 6 Cell battery

WebCode - White: FUJ0110
WebCode - Black: FUJ0111



MSI Wind U100+ Netbook

Breeze through your work

Equipped with a high resolution webcam, high performance 2 channel stereo speakers,Wireless N, and microphone, all fitted perfectly within the framework design, expressing the slickness of technology and the elegance of modern fashion.

- Intel Atom N280 1.66GHz
- 1GB DDR2 RAM
- 160GB SATA HDD
- 6 Cell battery
- Windows XP Home

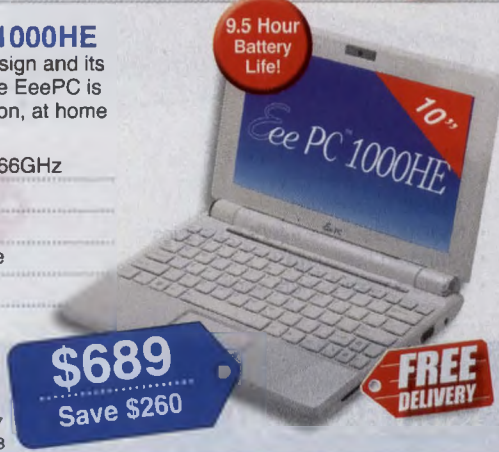
WebCode: Black - MSI0010

ASUS EeePC 1000HE

With a lightweight design and its rapid start up time the EeePC is always ready for action, at home or on the GO!

- Intel Atom N280 1.66GHz
- 1GB DDR2 RAM
- 160GB HDD
- Windows XP Home
- 6 Cell battery

WebCode - Black: ASU1207
WebCode - White: ASU1208



MSI VR602 Home Notebook

- Intel Dual Core T1600 1.66GHz
- 2GB DDR2 RAM
- 160GB SATA HDD
- Windows Vista Home Basic

WebCode: MSI0020

MSI X320 Slim Notebook

- Intel Atom Z530 1.60GHz
- 2GB DDR2 RAM
- 320GB SATA HDD
- Windows Vista Home Premium

WebCodes: White - MSI0016, Black - MSI0015

Lenovo G550 Notebook

- Intel Core 2 Duo T6500 2.1Ghz
- 3GB DDR2 RAM
- 250GB SATA HDD
- Windows XP Pro
- Vista Business Upgrade included

WebCode: LEN0218

Lenovo R500 Notebook

- Intel Core 2 Duo P7370 2.0Ghz
- 2GB DDR2 RAM
- 250GB HDD
- Windows Vista Business
- XP Pro Downgrade Included

WebCode: LEN0215

Acer X243HQ 23.6" Widescreen Full HD Monitor

Perfect balance between best value performance with full high definition

- 5ms Response time
- 40000:1 Contrast ratio
- 1920x1080 Resolution
- 300cs/m2 Brightness

Notebooks

- Larger Screen Size
- More Power
- Greater Functionality

Lenovo A58 Desktop + 19" LCD

The perfect balance of speed and reliability!

- Intel Core 2 Duo E8400 3.0Ghz
- 2GB DDR2 RAM
- 320GB HDD
- DVD Multiburner
- Windows XP Pro
- Vista Business upgrade included

WebCode: LDB0547

Acer X193HQ 19" Widescreen LCD

- 5ms Response Time
- 1366x768 Resolution
- 10,000:1 Constrast Ratio
- 300 cd/m2 Brightness

WebCode: ACM0148

BenQ E2200HD 22" Full HD Monitor

- 2ms Response Time
- 1920x1080 Resolution
- 1000:1 Constrast Ratio
- 300 cd/m2 Brightness

WebCode: BEN1322

MSI Wind Top AE1900 All-in-One PC

The future of desktop computing!

- Intel Atom N230 1.6GHz
- 1GB DDR2 RAM
- 160GB SATA Hard Drive
- Super Multi DVD-RW
- Wireless-N & Gigabit LAN
- 1.3MP Webcam
- Keyboard & Mouse included
- Windows XP Home

WebCode: MSI0014

Eaton 3105 700Va UPS

Never lose power to your devices again

- Protects small office and home office equipment from power outages,surges,sags, and line noise
- Saves space with a compact design that fits easily under a desk or can be conveniently wallmounted, with quick access to all receptacles

WebCode: PWR1003

BEST SELLER!

FREE DELIVERY

Wacom Intuos4

Whether you're a designer, drawer, artist, or animator, discover the tool used by professionals to turn their ideas into reality. With a new design and features inspired by your feedback, Intuos4 represents the finest pen tablet experience ever created by Wacom.

Small 4 x 6"	WAC4400	$300
Medium 6 x 9"	WAC6400	$510
Large 8 x 13"	WAC8400	$699
X-Large 12 x 19"	WAC1240	$1125

wacom

Logitech TrackMan Wheel

Smooth, ultra-precise tracking.

- Relieves wrist pain & aches.
- Ideal for animators, designers & the like!
- Mac & Vista Compatible

WebCode: LOG3762

Microsoft Arc Mouse

Comfort, Style, elegance, all in one.

- 2.4GHZ – up to 10m Wireless rang
- Folds for Portability
- Comfort for either hand

WebCode: MST8519

Logitech MX 620 Mouse

Up to 1 Year Battery life!

- Advanced one-touch search button
- 5 Years Manufacturer Warranty
- Ergonomically Designed for comfort

WebCode: LOG3614

Cyber Snipa Stinger Gaming Mouse

The mouse with a 1ms response tir

- 4 Different DPI settings 400-3200DPI
- 9 Buttons including 6 Macro programmable
- 7 x replaceable weights for precision

WebCode: ANY2014

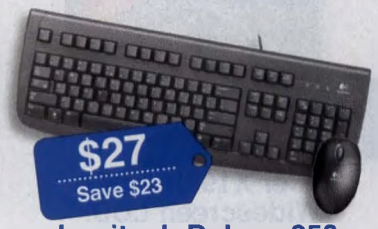
Clear the Clutter! Upgrade to Wireless

Microsoft Wireless Media Desktop 1000

Simple, yet versatile.

Sit back and enjoy fast, easy access to all your favorite digital pictures, music, videos, and more with this sleek, ultra-thin quiet touch desktop keyboard & Mouse.

WebCode: MST8491



Logitech Deluxe 250 Desktop

The cost effective desktop solution

With drain holes for spill-resistance. Includes the best selling and equally durable Logitech Optical Mouse, with a familiar shape and a quality feel - ideal for any user.

WebCode: LGO2138

Logitech Wave Keyboard

Pure comfort for under $40

- Contoured, wave key design
- Cushioned palm rest
- Adjustable keyboard height

WebCode: LOG3671

Fujitsu Wireless Media Presenter

Stores inside any laptop card slot!

- Powerpoint remote controls.
- Self contained wireless adaptor.
- Built-in laser pointer
- Plug-and-play

WebCode: FUJ540

Cyber Snipa Spotter Webcam

Custom designed for versatility.

- 640 x 480 Resolution @ 30 fps
- 7x-18x times detachable zoom lens
- Tripod included

WebCode: ANY0802

Logitech QuickCam Pro 9000

Crystal clear images and a stylish design

- Up to 8MP images via interpolation
- Automatic face tracking technology
- Skype compatible

WebCode: LOG3650

Microsoft Lifecam Webcam VX-3000

Keep in touch – With style!

- 640x480 Video
- 1.3MP Photo Stills
- Built in Microphone

WebCode: MST8426

Logitech 2.4GHz Cordless Presenter

Move around an auditorium with confidence

Effectively manage your time during presentations with a built-in programmable LCD timer.

WebCode: LOG34

Verbatim 400GB SmartDisk Portable HD

Weighs only 164g

- 2.5" HDD @ 5400 RPM
- Powered via USB
- 2 Year Warranty

WebCode: VBM9576

WD 500GB Drive + Portable ASTONE Enclosure

Fully assembled to Plug & Play with built-in USB Cable

- Aluminium Alloy Mesh Case
- One Touch Backup feature
- Windows, Mac & Linux compatible

WebCode: AST0020

Verbatim 1TB 3.5" USB 2.0 HDD

Nero back up software included

- Sleek 'Black Steel' Design
- Windows Vista Compatible
- 2 Year Warranty

WebCode: VBM512

LaCie 2TB Big Disk Quadra

eSATA, USB2.0, Firewire 400 & 800 connectivity

- RAID 0 for fast 165MB/s transfers
- Ideal for professional use
- Backup Software for WIN & MAC

WebCode: LAC1343

LaCie Network Space 1TB

Access your files from anywhere in the world!

- Store, back up and centralize your photos, music & videos
- Share content on your local network
- Enjoy your password-protected private share
- Connect and forget; compact & quiet
- Stream media directly to your PS3 & XBOX 360.
- Access your files remotely via FTP over the internet!

WebCode: LAC1000

Have you ever lost data? Back it up now!

D-Link DUB-H7 7 Port USB 2.0 Hub

Connect up to 7 devices to one USB Port

- Backward compatible to USB 1.1,1
- Diagnostic LEDs provide port status

WebCode: DLK1122

SanDisk Cruzer Micro U3

The market leading flash drive

The Cruzer Micro design is a small, smart and secure USB Flash Drive.

2GB	SAN0061	$15
4GB	SAN0062	$21
8GB	SAN0103	$37
16GB	SAN0164	$62

Kingston DT200 USB Key

Space, speed & security

32GB	KIN0091	$111
64GB	KIN0092	$192
128GB	KIN0090	$528

Sandisk Memory Cards

Standard SD

4GB (SAN0115) $18
8GB (SAN0116) $33

Ultra II SD

4GB (SAN0098) $22
8GB (SAN0101) $40
16GB (SAN0151) $72

Ultra II Compact Flash (CF)

4GB (SAN0023) $36
8GB (SAN0037) $50

Memory Stick Pro Duo

4GB (SAN0053) $33
8GB (SAN0120) $60

Ultra II Memory Stick Pro Duo

4GB (SAN0066) $43
8GB (SAN0072) $78

Extreme III SD

4GB (SAN0125) $30
8GB (SAN0126) $63
16GB (SAN0179) $198

Extreme III Compact Flash

4GB (SAN0107) $49
8GB (SAN0108) $79
16GB (SAN0157) $121

NETGEAR RND2150 ReadyNAS Duo 500 GB

Keep all your Documents, Movies, and Pictures secure

The ReadyNAS Duo is perfect for homes with more than one computer. Unlike a USB drive, the ReadyNAS connects to the network and is simultaneously accessible via all connected Windows or Macintosh computers.

WebCode: NTG8133

Verbatim Storage Media

CD-R x 100	VBM4554	$27
DVD-R x 25	VBM0580	$12
DVD-R x 100	VBM5153	$42
DVD+R x 50 Inkjet	VBM1974	$23
DVD+R x 100 Inkjet	VBM1995	$47
DVD+R DL 8.5Gb x 20	VBM4981	$52
BD-R 2x 25GB 5Pk	VBM4361	$68
BD-R 2x 25GB 10Pk	VBM6068	$138

Linksys WRT54GL Linux-based Wireless-G Router

Designed specifically for hobbyists and wireless aficionados

- Eliminate the need for cables
- Compatible with Wireless-B
- Browser-based configuration utility

WebCode: LNK5525

Linksys WAG160N Wireless-N ADSL2+ Modem Router

The All-in-one ADSL2+ solution

High-speed ADSL2+ Modem gives you a fast, "Always On" connection to the Internet.

WebCode: LNK628

Billion BiPAC 7404VNPX ADSL2+ Firewall Router

The router that has it all - VOIP, 3G, ADSL2+, Wireless-N

- Dual WAN interfaces for ADSL2+ and 3G connections
- High speed Internet access with ADSL2 / 2+; backward compatible with ADSL
- 802.11n Wireless AP
- High-speed wireless connection up to 300Mbps data rate
- Auto fail-over feature to ensure an always-on connection
- Voice over IP compliant with standard phone system

WebCode: BIL004

Did you know?

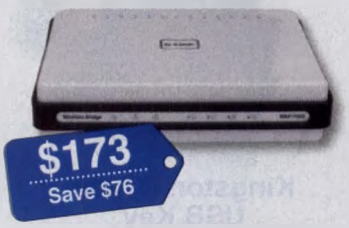
- Wireless G - Ideal for Internet Browsing & Downloading
- Wireless N - Multimedia streaming / Gaming

D-Link Wireless 108G Multifunction Print Server

First print server to work with multifunction

The D-Link RangeBooster G Print Server is D-Link's most versatile and easiest to use Print Server yet.

WebCode: DLK9211



D-Link DAP-1522 Multi Wireless Access Point

Make your Wired devices..Wireless!

The D-Link Xtreme is designed for users to create, or connect multiple wired devices to an existing wireless network.

WebCode: DLK1522

NETGEAR Powerline AV Ethernet Adapter Kit

Turn any power outlet into high speed network connection

- Fast enough to stream HD video
- Plug and Play – no setup required
- Connect easily to TiVo, Consoles or TVs

WebCode: NTG8167

Linksys Wireless G Internet Camera

Send live video and audio wirelessly

- Monitor your house online
- No PC Required
- Automated Security Messaging

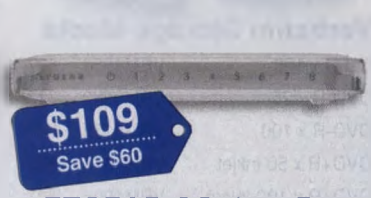
WebCode: LNK628

NETGEAR ProSafe GS105 5 Port Gigabit Switch

Green energy, with a lifetime warranty

- Auto-switching Ethernet connection for any device speed
- Up to 60% lower power consumption
- LEDs to monitor link, speed and activity

WebCode: NTG7117



NETGEAR GS608 8 Port Gigabit Switch

Move files across your network fast!

- Fast Ethernet for up to eight computers
- Fanless design for quiet operation
- Plug and Play installation

WebCode: NTG7186

HP ProCurve 1800-8G 8 Port Switch

Designed for affordability & minimal network configuration

Small and quiet for unobtrusive performance. Perfect for business.

WebCode: HPE9029

NETGEAR ProSafe GS724T Switch 24 Port

Management at an Unmanaged Pric

- 2 Fibre Ports
- Web-based Management
- ProSupport Extended Warranty Available

WebCode: NTG71

SAMSUNG

Australia's Best value Business Printer

Samsung CLX-6210FX Colour Multifunction

Australia's Best colour multifunction!
Reach out and explore the possibilities! The CLX-6210FX series is designed to fit the way your business works. There are a variety of advanced features, and simplified connectivity to match your needs.

- 20 ppm Colour & Mono
- Duplex / Copy / Scan / Print / Fax
- USB or Ethernet connection
- 1 Year onsite warranty

$798 Save $401

Exclusive to City Software BONUS $2,000 Accommodation Vouchers with any of these Samsung printers* see citysoftware.com.au for full terms & conditions

RYDGES Radisson Best Western

WebCode: SAM6210

5K Black	SAM6361	$168
5K Cyan	SAM6362	$223
5K Magenta	SAM6363	$223
5K Yellow	SAM6364	$223

$130 Save $39

Canon PIXMA iP4600 Inkjet Printer

Vibrant photos & documents at home

- Up to 21ppm Colour
- 9600x2400 DPI
- CD & DVD Printing
- USB 2.0

WebCode: CNN0009

Black	CAN7000	$18
Cyan	CAN7003	$18
Magenta	CAN7002	$18
Yellow	CAN7001	$18

$529 Save $270 Exclusive to City Software BONUS $2,000 Accommodation Vouchers*

Samsung CLP-610ND Colour Laser

Efficient and sharp detail

- 20ppm Colour
- 2400x600 DPI printing
- Built-in Duplexer
- USB, Ethernet

WebCode: SAM0610

5K Black	SAM6361	$168
5K Cyan	SAM6362	$223
5K Magenta	SAM6363	$223
5K Yellow	SAM6364	$223

$799 Save $300 Exclusive to City Software BONUS $2,000 Accommodation Vouchers*

Samsung SCX-5635FN Mono Multifunction

Powerful Multifunction for Small to Large Businesses

- Print, Scan, Copy, Fax
- 33ppm Mono
- Easy to scan to email and network
- USB, Ethernet
- Windows & Mac OSX,

WebCode: SAM5635

4K Black	SAM2081	$133
10K Black	SAM2082	$269

$1598 Save $1101 Exclusive to City Software BONUS $2,000 Accommodation Vouchers*

Samsung SCX-5835FN Mono Multifunction

Ultimate SMB Document Management MFP

- Print, Scan, Copy, Fax
- 33ppm Mono with Duplex
- Large colour touch screen
- 80GB Hard drive
- Easy to scan to email and network
- USB, Ethernet

WebCode: SAM5835

4K Black	SAM2081	$133
10K Black	SAM2082	$269

$352 Save $96

Canon PIXMA MP980 All-in-One Inkjet Printer

Network-Ready multifunction inkjet

- 9600x2400 dpi printing
- Wireless/Wired LAN
- 3.5" colour TFT screen

WebCode: CNN0980

Black	CAN7000	$18
Grey	CAN7004	$18
Photo Black	CAN7005	$27
Cyan	CAN7003	$18
Magenta	CAN7002	$18
Yellow	CAN7001	$18

$218 Save $331

Fuji Xerox PE220 WorkCentre A4 Mono MFP

Budget multifunction printer

- 20ppm Mono
- 600 x 600 DPI printing
- Fax / Copier / Printer / Scanner
- USB, Parallel

WebCode: FXP1220

3K Black	FXP0683	$122

$462 Save $196

Fuji Xerox DocuPrint C1110N Colour Laser

Networked colour laser

- 16ppm Mono & 12ppm Colour
- 9600 x 600 DPI
- 250 Sheet Paper Tray
- USB 2.0, Ethernet

WebCode: FXP1111

2K Black	FXP1114	$97
2K Cyan	FXP1115	$156
2K Magenta	FXP1116	$156
2K Yellow	FXP1117	$156

$619 Save $179

Fuji Xerox DocuPrint C1190 Colour Multifunction

Print / Copy / Scan / Fax

- Resolution 600 x 600 DPI
- 12ppm Colour / 16ppm Mono
- PC & MAC Compatible
- USB 2.0, Ethernet

WebCode: FXP1190

3K Black	FXP1196	$118
3K Cyan	FXP1194	$189
3K Magenta	FXP1195	$189
3K Yellow	FXP1196	$189

BONUS $50 Home or Office Bundle

FREE DELIVERY

$349 Save $100

Canon PIXMA iP100 Portable Inkjet Printer

Affordable document solution

- 20ppm Mono, 14ppm Colour
- 9600 x 2400 DPI
- USB, infrared

WebCode: CAN0732

Black PGI-35	CAN8104	$14
Colour CLI-36	CAN8105	$28

DVD Maker 2 - USB

The easiest way to capture videos from your camcorder or VCR and convert them to MPEG4 format.

Transfering all your VHS, & Camcorder tapes to a DVD, or Digital format has never been easier! The easy to use software included allows you to capture, edit and author your masterpiece. Bundled with Cyberlink Power-Director 6 & PowerProducer 4, converting your memories to digital is now a breeze!

- Composite Input; RCA jack; S-Video 4-pin Mini-Din
- NTSC 720 x 480 @ 30 FPS; PAL 720 x 576 @ 25 FPS
- RCA L/R Audio input

WebCode: AVL1022

AVLabs USB HD Digital TV Tuner

Watch TV on your computer!

With the AVLabs USB High Definition Digital TV Tuner, you can enjoy watching or recording digital TV on your computer or laptop.

WebCode: AVL1013

Pinnacle Dazzle DVD Recorder

Transfer video footage to high quality DVD!

The Dazzle USB Box connects easil to a VCR, DVD player, camcorder o almost any other video device.

WebCode: PIN01

OLIN DVD Player JMK-3802

The DVD Player under $50

WebCode: WST0002

Hailo HDSTB-8000 High Definition Set Top Box

Low Cost Digital TV in High Definition!

WebCode: HAI0001

Convert to digital and store

HD HomeRun Network TV Tuner

One TV Tuner for all your PC's

- Supports free-to-air Digital TV
- Watch, pause, and record Live TV from any computer on your network.

WebCode: LAK0014

LaCie LaCinema Classic 1TB

Play your movies, music & photos on any TV

- Play your movies, music, and photos on any TV
- Connect via HDMI (1080p)

WebCode: LAC9500

Western Digital TV HD Media Player

Play media from your USB HDD on your TV!

- Plays H.264, MKV, AVI, WMV & a large variety of MPEG video files
- Supports FAT32, NTFS & HFS+ file systems
- Plays Music, Video and Photos
- 1080P HDMI & Optical Outputs
- Includes FREE media conversion software
- Access two USB drives simultaneously

WebCode: WDD02

Logitech Harmony 785 Universal Remote

Control your Home Entertainment system

- Teletext control
- Easy setup
- Fully backlit keypad

WebCode: LOG3596

Logitech Harmony One Universal Remote

Control up to 15 devices

- Full colour touch screen
- Intuitive button layout and an ergonomic design

WebCode: LOG3681

D-Link DSM-330 DivX HD Media Player

Stream high quality video, photos & music wirelessly to your home theatre system

- Play all your media files in DivX from the PC and the Internet, including DivX HD Videos with menus and subtitles
- Access online Video Services with your remote control without leaving the couch
- Add a personal touch with DivX Connected Plug-ins for Gaming and Infotainment Services

WebCode: DLK33

Sansai FM Wireless Headphones

Up to 10m Range

The ideal solution for anyone that needs headphones without the inconvenience of wires.

WebCode: SAS0100

Sennheiser HD202 Headphones

High quality for everyday use

Dynamic Hi-Fi stereo headphones are an ideal partner for DJs. Great for games, and watching movies.

WebCode: SNH0005

Logitech Z Cinema 2.1 Speakers

Surround Sound Audio System

- Infrared Wireless Remote included
- Great for Gaming, Movies, & Music

WebCode: LOG3680

Logitech Squeezebox Boom

Stream your favourite tunes

The compact all-in-one network music player that lets you listen to the music you love in any room.

WebCode: LOG3749

Akai Micro HiFi System with iPod Dock

The all-in-one sound system packed with features.

Play your favourite tunes from a variety of sources, including iPod, CD player, USB flash drive and more.

WebCode: AKI0002

OXX - DAB+ Classic Internet Digital Radio

10,000 Radio Stations, at your fingertips!

- Supports DAB and DAB+ Digital Radio
- iPod & Mp3 Player Inputs.
- Internet Radio Access

WebCode: LAK0015

AVLabs Music Studio

Digitize your old vinyls and cassettes to CD or DVD

- Convert Analogue Music to Digital Format
- Capture Music from a Wide Variety of Sources
- Combine your PC and Stereo to Create the Ultimate Home Entertainment
- Capture and Mix Your Voice with the Music Simultaneously
- Easy to use Roxio software included

WebCode: AVL1016

your memories forever

Kaiser Baas PhotoMaker Digital Slide Scanner

Convert 35mm Slides and Negatives to Digital Photos

- Capture directly to PC with the touch of a button
- Includes slide and negative holders.
- Software to edit, enhance, email, print, and burn your photos to DVD.
- XP & Vista compatible

WebCode: KAB0025

AVLabs Digital Photo Frames

Showcase your favourite memories

1.5"	Keychain	AVL1023	$17.95
7"	Frame - Black (480 X 234)	AVL1019	$58
10.4"	Frame - Black (640 X 480)	AVL1020	$154
12"	Frame - Black (1280 X 768)	AVL1021	$196

Canon CanoScan Lide 700F Scanner

Slimline document scanner

- 9600x9600dpi
- Single frame slide scanning
- One cable setup

WebCode: CNN0038

Canon CanoScan 8800F Scanner

High speed document / Photo / Slide scanner

- 4800x9600dpi
- Continuous scanning of up to 12 slides
- Scan to PDF

WebCode: CAN5015

Stash DV Z1 Digital Video Camera

HD 1080P, 4:3 at 30 FPS

WebCode: STA1000

Canon Digital IXUS 80 IS Silver

Capture memories with ease

WebCode: CAN0695

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Up to 14 hours talk time
Up to 255 hours standby

Jabra SP700 Bluetooth Speakerphone

Make and recieve phone calls safely and easily

WebCode: JAB0008

GNX Adjustable & Foldable Compact Laptop Riser

Laptop stand – adjustable and foldable

- Folds Flat for storage
- Supports laptops up to 15"

$9.95
Save $20

WebCode: GNX0003

All in One Battery Tester

Test all types of batteries currently out on the market

- Compatible with AA,AAA, C,D,9V batteries & more.
- LCD Display

$19.95
Save $10

WebCode: ELE0017

Otek Slide Scanner 2.5" Screen

Convert your 35mm Negatives and slides to Digital!

- 5 MP Capture Resolution
- Stand Alone Operation

$129
Save $140

WebCode: OTE0003

Universal Solar Powered Phone Charger

Charge your Phone, Camera, & iPod with Solar Power!

- Built-in LED Torch
- Charge your phone in 60-90mins!

$29.80
Save $20

WebCode: CAR0010

AVLabs Music Studio

Convert your old vinyls to Digital!

- USB Powered!
- Transfer @ 30Mb/s

$99
Save $61

WebCode: AVL1016

AData Classic – 2.5" External Hard Disk Drive – 320GB

Storage with Style & Mobility!

- 2.5" HDD @ 5400 RPM
- Powered via USB
- Transfer @ 30MB/s

$93
Save $50

WebCode: ADT0001

AVLabs Keyring 1.5"

Keep your loved ones close.

- USB Charged
- Easy to use interface

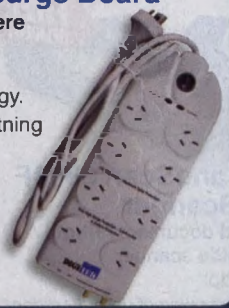
$17.95
Save $12

WebCode: AVL1023

Digitek 8-Way Surge Board

Surge protection where you need it most!

- Keep your house free of unclean Energy.
- Protection from Lightning strikes, Electricity Surges, & Spikes.



$29.95
Save $29

WebCode: BIT0001

Olin Mobile Note Taker with Writing Recognition

Draw on any surface and save it digitally!

- Save up to 100 A4 pages digitally.
- Handwriting recognition software incl.

$99.95
Save $49

WebCode: OLI0011

ONLINE MEGA DEAL OF THE DAY

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51% Saved

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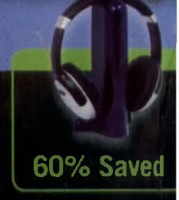
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Up to $300 Bonus for Every Notebook and PC

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DreamBook Style M76/M74

From $699

RRP Inc-GST

- The BEST VALUE notebook
- Intel Core Duo/Core 2 Duo Processor
- Up to 4GB DDR2 Memory
- 15.4"/14" Widescreen WXGA Display
- Up to 256MB Integrated/nVidia 105M 512MB VGA
- Optional 802.11b/g Wireless, Bluetooth, Integrated 1.3 Mega Pixel Camera

DreamBook Light T11 (Ultra Thin)

From $899

RRP Inc-GST

- AMD Yukon 210U 1.5GHz CPU
- Up to 2GB DDR2 Memory
- 13.3" Widescreen WXGA Display
- ATI Mobility Radeon X1250 Graphics
- SATA Hard Drive, Optional Internal DVD
- Optional 802.11b/g Wireless, Bluetooth, Integrated 1.3 Mega Pixel Camera

DreamBook Power TW8

From $1099

RRP Inc-GST

- Great value high performance workstation
- Intel CENTRINO 2 Dual/Quad Core Processor
- Up to 8GB DDR2 Memory
- 15.4" Widescreen WXGA Display
- nVidia GeForce Go 9600M GS-512MB PCI Express Graphics
- 4-in-1 Card Reader, High Definition Audio

DreamVision PC Game Motion Controller V11

From $179

RRP Inc-GST

- Play Wii-like games on Your PC and Notebook
- First in Australia
- 3D motion-sensing for 1:1 real-time response
- Ergonomic transformer design - 5 modes in 1 without any additional add-ons. Simply twist to transform between game modes
- Supports all PC games, no console required

DreamBook Power M77

From $1149

RRP Inc-GST

- New HIGH PERFORMANCE notebook
- Intel CENTRINO 2 Dual/Quad Core Processor
- Up to 4GB DDR2 Memory
- 17" Widescreen WXGA Display
- nVidia GeForce G 105M 512MB dedicated PCI Express Graphics
- Integrated 1.3 Mega Pixel Camera

DreamBook Power M57T

From $2699

RRP Inc-GST

- High Performance Workstation
- Intel CENTRINO 2 Dual/Quad Core Processor
- Up to 8GB DDR3 1333MHz Memory
- nVidia GeForce Go 9800GT 512MB/9800GTX 1GB
- 17.1" Widescreen WUXGA Crystal Bright Display
- Free Fingerprint Reader
- 2 Mega Pixel Camera

DreamBook Power M86

From $2299

RRP Inc-GST

- Super high end and compact workstation
- Intel CENTRINO 2 Dual/Quad Core Processor
- Up to 8GB DDR3 1333MHz Memory
- nVidia GeForce Go GTX 260M 1GB PCI Express Graphics
- 15.4" Widescreen WXGA/WUXGA Crystal Bright
- 2 Mega Pixel Camera

DreamVision Mini (ION Version) Green PC Cap 7

From $499

RRP Inc-GST

- Low-Power Green PC
- Intel Atom N230 1.6GHz Processor
- Up to 2GB DDR2 Memory
- Up to 256MB Integrated / Up to 512MB nVidia 9400M Graphics
- Up to 500GB SATA Hard Drive
- Optional TV, Wall, Vesa mounting kit

DreamBook Power M98

From $3999

RRP Inc-GST

- The Perfect Graphics Workstation
- Intel CENTRINO 2 Dual/Quad Core Processor
- Up to 8GB DDR3 1333MHz Memory
- nVidia GeForce Go GTX 280M 1GB SLI Graphics
- 18.4" Full HD (1920x1080) Crystal Bright Display
- Free Fingerprint Reader
- 2 Mega Pixel Camera

DreamBook Power D90 i7

From $3699

RRP Inc-GST

- Intel Core i7 Processor
- Up to 12GB DDR3 1333MHz Memory
- nVidia GeForce Go GTX 280M 1GB DDR3
- 17.1" Widescreen WUXGA Crystal Bright Display
- 3 x SATA2 Hard Drives with RAID 0/1/5 support
- Optional TV Tuner, 1.3 Mega Pixel Camera, Wireless 802.11b/g/n, Bluetooth

DreamBook Power 9070

From $1699

RRP Inc-GST

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